

Forests of the Northwest: A Time for Reflection

The 1986 Starker Lectures

**College of Forestry
Oregon State University
Corvallis, Oregon**

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Dedication

The Starker Lectures Dedicated to the memory of T.J. and Bruce Starker

Thurman James Starker--T.J. to all who knew him--was born in Kansas in 1890. His family moved to Portland, Oregon, in 1907. In 1910 T.J. was among four members of the first forestry graduating class of Oregon State University, then Oregon Agricultural College. In 1912 he earned a master's degree from the University of Michigan. For ten years afterward, T.J. served in a variety of Forest Service and forest industry jobs. He joined the forestry faculty at OSU in 1922. In 1936 he began to acquire tax-delinquent and cutover forestland in the Coast Range of Oregon. He left OSU in 1942 so he could devote more time to the management of what became the Starker Forests, which today amount to some 55,000 acres. He remained involved in a number of government and civic affairs, receiving many honors and much recognition. He died in 1983 at the age of 92.

His son, Bruce Starker, was born in Portland in 1918. He followed in his father's footsteps at Oregon State University, graduating in forestry in 1940. After earning a master's degree from Yale University in 1941, he served in the Coast Guard during World War II. He returned to Oregon in 1946, joining T.J. in the management of their increasing forestland holdings. T.J. had acquired much good-quality, already-stocked Douglas-fir land. Bruce concentrated on acquiring and rehabilitating high-quality, often brush-covered land. Bruce brought with him an emphasis on technology in the management of the Starker forestland. He adopted a variety of improved reforestation techniques and used genetically improved planting stock. Tragically, Bruce was killed in an airplane accident in 1975 while inspecting Starker lands near Yamhill, Oregon.

Both T.J. and Bruce worked to bring about an improved public understanding of forestry issues in Oregon. Both were quick to call attention to forestry concerns, T.J. most often in his frequent letters to the editor, Bruce in his less-visible but equally effective involvement with public and private groups. Bruce and T.J. worked closely with OSU's forestry faculty, through research to learn more, and through education to share what they had learned.

The Starker family today continues this commitment to public education in forestry issues. Their involvement includes hosting field trips to the Starker Forests, allowing an easy access of Starker family members and forestry staff to students and professional and citizens' groups, and sponsoring the annual Starker Lectures. The Oregon State University College of Forestry is proud, along with the Starker family, to dedicate this lecture series to the memory of Bruce and T.J. Starker, Oregon Starkers and foresters. Each in his own way was an educator as well.

Foreword

In 1986 foresters in the Northwest were in a time of stock-taking. Land management plans were nearing completion on the National Forests, Canadian imports were threatening local forest industries, environmental and commodity conflicts remained intense, and federal and state relationships were changing. Because of the uncertainties surrounding forestry in 1986, we chose as a theme for the Starker Lectures, *Forests of the Northwest: A Time for Reflection*. Four distinguished speakers addressed various aspects of that theme.

The ecologist Richard Waring explores the scientific foundations for forestry in the Northwest, calling special attention to recent research that has modified forestry practices here. He also examines the questions of limits and opportunities, drawing heavily on his recent book entitled *Forest Ecosystems: Concepts and Management*, co-authored by William H. Schlesinger.

Les Reed, the Canadian economist, discusses timber supply issues both in Canada and in the U.S., in light of pending import duties on Canadian lumber. (In fact, since his lecture, a 15% Canadian surcharge has been imposed.) He points out that both countries have near-term timber supply problems, and suggests steps to resolve these problems and their associated trade issues.

The economist John Krutilla reports on recent research into the difficult question of how to allocate resources among competing interests in a multiple-use forestland setting. He points out that foresters following intuitive judgment are often more comprehensive and "on-target" than policy analysts relying on more traditional economic theory. He and his colleague Mike Bowes offer new ways to examine resource allocation in a multiple-use setting.

Jerry Miles, a long-time public administrator, observes that the management of natural resources is increasingly dependent on political, and not necessarily professional, decisions. He asserts that those governmental institutions least responsive to the will of the people—for example, the judiciary and the bureaucracy—are becoming more and more powerful. He concludes with advice on making forestry-related policy—and governmental policy in general—more responsive to the will of the people.

I believe T.J. and Bruce Starker would have wanted the lectures that bear their name to address contemporary issues. The 1986 Starker Lectures certainly do that. I also believe that the words and ideas of these four scholars do much to shed light on the crucial concerns of forestry in these uncertain times.

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THE ECOLOGICAL FOUNDATION FOR FORESTRY IN THE NORTHWEST—LIMITS AND OPPORTUNITIES

by

Richard H. Waring

The Pacific Northwest contains a unique climatic region dominated by Douglas-fir and other coniferous trees that may grow to gigantic dimensions (Franklin and Waring, 1980). The region, for the most part, is a land only recently developed. Many of its lakes and mountains still bear the chill of icy glaciers and the warmth of banked volcanoes.

We relative newcomers to the Northwest are just learning its ecological history. We look to our ecological roots to understand the foundation

"Spanish sea captains first viewed our coasts as flaming forests whose embers threatened to set fire to their sails."

of our resources and the opportunities that exist for future generations. We do this near the end of more than a century of intensive exploitation, recognizing as few other cultures have that the choices we now are about to make will sculpt the future landscape and its biota as much, and as permanently, as the glaciers and volcanoes did before.

Spanish sea captains first viewed our coasts as flaming forests whose embers threatened to set fire to their sails. These extensive fires gave rise to the forests described more than two centuries later in the journals of Lewis and Clark. So we know for certain that the region's ecological resilience is immense. But our conclusions must be tempered, for the Coast Range is the most benign of all regions in the Northwest for growing vegetation, and the frequency of fire there was much lower than elsewhere (Waring and Schlesinger, 1985). We may make an analogy with the city of San Francisco, which was destroyed by fire after the earthquake of 1906. The city has had time to rebuild and now bears few reminders of its violent past.

Today, with the removal of most of the forests observed by Lewis and Clark, we have many options, for the Coast Range and other mountainous parts of the Northwest are not destined to be cities. The forested landscape, however, already is heavily used. Its future, like that of cities, can be

"... the choices we now are about to make will sculpt the future landscape ... as much ... as the glaciers and volcanoes did before."

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diminished if care is not taken in choosing the routes of transport, the sites for intensive activities, and the support of groups essential to the functioning of the system. To ignore concerns for pure water, health care, and the possibility of civil disasters would endanger the future of human communities. With this perspective, let's search for the protective devices operating in forest

"But not always are community members in perfect harmony, and certainly at times they act to the detriment of their immediate neighbors."

communities.

In many ways, the natural system operates like a highly-developed human community. It lives largely on its current resources, but in times of stress it relies on stored reserves (Fig. 1), or on the delivery of critical supplies from outside. For example, the rapid establishment of vegetation after the destruction of forests on the slopes of Mount St. Helens was dependent on stored seeds

basic biological components: 1) vegetation, 2) animals, and 3) microbial organisms. These classes of living things, like classes of citizens, perform a variety of tasks essential to the whole community. But not always are community members in perfect harmony, and certainly at times they act to the detriment of their immediate neighbors. For example, insects may defoliate or kill large numbers of trees. Lethal microbes may infect both animals and plants. The true effect on the system, however, cannot be judged merely by the complaints of the neighbors. Clearing away injured or unproductive components may improve opportunities for others. Thus in a Douglas-fir forest suffering a 30% reduction in canopy due to laminated root rot, the remaining trees increase their annual growth to match the loss (Oren *et al*, 1985).

The coastal forests of the Pacific Northwest are places where the inhabitants seldom rest, for the generally mild climate allows vegetation to grow throughout the year. Without soil freezing, microbial decay processes never cease. Most of the animals are permanent residents and few of them hibernate. Because of this ceaseless activity, tons of organic matter are produced and consumed and become decayed. Still, forests continue

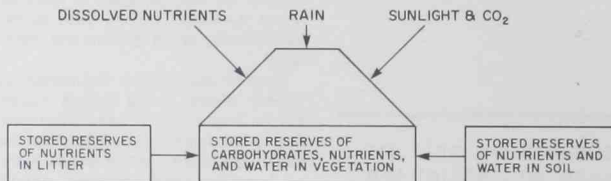


Figure 1. Tree growth requires water, sunlight, carbon dioxide, and dissolved nutrients. When these resources are not available, trees may subsist on stored reserves of water, nutrients, and carbohydrates. The soil and litter are additional sources of nutrients and water critical to the growth and survival of long-lived trees.

and buried rhizomes, along with seed dispersal from adjacent areas. Of course, we may intervene to speed up, slow down, or alter the course of natural processes. But before we do, we need some insights into how nature takes care of itself. For some components which we might normally ignore, or even fight against, have special value. Their loss would require a much greater effort on our part to keep the system functioning efficiently.

A forest, like all terrestrial systems, has three

to grow, often accumulating structure at the rate of more than 20 tons per acre each year. They produce in a few centuries up to 1,000 tons of woody material if not disturbed (Table 1). Of course, most of what accumulates is wood and bark, for these tissues decay slowly. But woody stems are only a small fraction of the total organic matter produced. We forget this because leaves and small roots which contain high concentrations of nutrients decay so rapidly. Few critical nutrients are lost, even during heavy rainstorms, be-

TABLE 1. ABOVEGROUND NET PRIMARY PRODUCTION ESTIMATES FOR CONIFEROUS FORESTS IN THE PACIFIC NORTHWEST (WEST OF THE CREST OF THE CASCADE RANGE). (After Franklin and Waring, 1980).

Community type	Stand age	Net primary Biomass	productivity
	years	mt/ha	mt/ha/yr
Coast redwood	"old"	3,200	14.3
Western hemlock	26	192	36.2
Western hemlock/Sitka spruce	110	871	10.3
Sitka spruce/western hemlock	130	1,080	14.7
Western hemlock/sitka spruce	130	1,492	12.3
Douglas-fir	150	865	10.5
Douglas-fir	125	449	6.6
Douglas-fir/western hemlock	100	661	12.7
Douglas-fir/western hemlock	150	527	9.3
Noble fir/Douglas-fir	115	880	13.0
Douglas-fir/western hemlock	450	718	10.8

cause microbes, active roots, and other organic constituents in the soil catch the most essential elements like nitrogen (Table 2).

When an unusually heavy storm befalls a forest, such as the storm of December 1964, large segments of the slope may peel away, exposing bare soil to the elements and allowing large masses of debris to be carried downslope and into stream channels. Such erosion has a high probability in areas where the underlying geology is unstable (Fig. 2). In more geologically firm areas, the roots of trees form a nearly tear-proof mat. Even if the surface mat of roots fails, much of the mass of moving debris hangs up on other trees, both standing and fallen.

When fires are extensive, so is erosion, as evidenced by layers of charcoal in floodplain sediments (Stone and Vasey, 1968). The rapid reestablishment of the system's integrity depends on the presence of animals and plants barely noted before. Alder, usually restricted to streambanks, seeds by wind into bare areas and begins to heal the exposed soil surfaces. A special bacterium harbored in alder roots, as well as in roots of a few other Northwest species, captures nitrogen from the air so that within a few decades, two to four tons of fertilizer are added to each acre (Bormann and Gordon, 1984). The fertilizer remains available to future generations of conifer

forests that lack the ability to acquire nitrogen-fixing bacteria. At the same time, other species rare to the original forest, such as fireweed and black raspberry, colonize bare areas. These types of plants, although small in stature, can use the same amount of nutrients and water as a mature forest, or more. Larger shrubs that come later form a root-net that is stronger pound for pound than that provided by conifer trees (O'Loughlin and Ziemer, 1982).

The colonizing plants attract and support large

"There is abundant evidence that any system, no matter how productive, can be permanently degraded."

populations of animals. Birds play an important role by bringing in new seeds from unburned areas. Deer and elk also carry fresh sources of seed on their coats and in digested food. With the establishment of some cover, small rodents begin to creep out along fallen trees and spread the spores of selected species of fungi (Maser *et al.*, 1978). These fungi enable conifers to take up nutrients more efficiently from the soil (Reeves *et al.*, 1979).

Many steps involved in allowing forest systems to perpetuate are still unknown. There is abundant evidence that any system, no matter how productive, can be permanently degraded. Mountainous areas are particularly prone to abuse. Professor R. K. Hermann (1975) summarized the degradation of forests since recorded history and concluded that much of the poverty now common in the Mediterranean region, North Africa, and much of Asia resulted indirectly from the destruction of forested watersheds. In some cases, such as in North

there are more options than in other regions. Small mistakes are likely to be forgiven. Also, because forest crops in this region generally have a high economic value, the burden of maintaining some key ecological functions artificially is a possibility. Already the costs of seed production and seedling establishment are part of human enterprise. In some areas, fertilizers are being applied at regular intervals. Recently some forest nurseries have begun to control the kinds of symbiotic fungi present on the roots of conifer

TABLE 2. CHEMICAL COMPOSITION OF PRECIPITATION, SOIL SOLUTIONS, AND GROUNDWATER IN A 175-YEAR-OLD SILVER FIR STAND IN NORTHERN WASHINGTON (After Ugolini *et al.*, 1977). (Used by permission of Academic Press, Orlando, Fla.)

Solution	pH	Total Cations (mEq/liter)	Soluble Ions (mg/liter)			Total (mg/liter)	
			Fe	Si	Al	N	P
Precipitation							
Above canopy	5.8	0.03	0.01	0.09	0.03	0.60	0.01
Below canopy	5.0	0.10	0.02	0.09	0.06	0.40	0.05
Forest floor	4.7	0.14	0.04	3.50	0.79	0.54	0.04
Soil							
15 cm A2	4.6	0.12	0.04	3.55	0.50	0.41	0.02
30 cm B2hr	5.0	0.08	0.01	3.87	0.27	0.20	0.02
60 cm B3	5.6	0.25	0.02	2.90	0.58	0.37	0.03
Groundwater	6.2	0.26	0.01	4.29	0.02	0.14	0.01

Data from Ugolini *et al.* (1977), *Soil Sci.* 124, 291-302. Copyright (1977) The Williams & Wilkins Co., Baltimore.

Africa, a climatic shift followed loss of transpiring vegetation, so that deserts now occupy the formerly fertile lands of ancient empires.

It is unlikely that the forests of Oregon will disappear, and even less likely that their removal would substantially affect rainfall. But some present practices do change the natural patterns of events. Intensive forestry favors a few species of trees, often genetically selected to grow fast and straight but not necessarily to resist drought, nutrient deficiencies, insects, or disease.

Most associated species of trees and other vegetation are viewed as potential competitors with crop species. Herbicides, pesticides, and fumigants are used to mold the ecological community to a narrower representation of the original. Short harvest schedules mean more trespass with heavy equipment, more frequent disturbance, and a general reduction in the size, complexity, and integrity of forested landscapes.

Because the Coast Range is so bountifully endowed with fertile soils and a mild climate,



Figure 2. Unstable areas such as slumps and earthflows can be identified and mapped so that roads and harvesting activities can be planned to minimize risks. In this map of an Oregon drainage, some roads unfortunately were placed across active slumps and subsequently failed. (From Swanson and James, 1975. Used by permission of Academic Press, Orlando, Fla.)

seedlings.

Some practices, however, rush the normal recovery processes, and thus quite unintentionally endanger the system's future integrity. For example, the widespread clearing of brush after harvesting weakens the network of reinforcing roots that for their size are two to three times stronger than the original conifer roots that held the soil mantle together (O'Loughlin and Ziemer, 1982). Selective herbicides can easily kill nitrogen-fixing species, and although nitrogen and other essential elements can be added, the absence of fast-growing species with high nutrient demands allows increased leaching of nitrate and other nutrients to groundwaters and streams.

The exposure of soil without plant cover increases the production of nitrate and its subsequent leaching. This is of special concern in the Tahoe basin of California, where purity of the lake's water is threatened. The lake's impurity is directly associated with housing and road developments along shores and streams. Such development adds nitrate and thus increases algal growth in the lake.

The careful clearing of all deadwood from logged areas and from stream channels is another policy that leads to increasing ecological concern. In regions where large boulders are rare, as in much of the Coast Range, the giant boles of cedar and Douglas-fir play an important role in dissipating the force of water and in channeling its flow to cut out deep pools and make backwaters (Sedell and Swanson, 1984). Such wooden dams rarely halt fish migration from the ocean, and they

"Logging methods are considerably more gentle than in previous times."

create an ideal habitat for the survival and growth of young salmon and steelhead trout (Bisson and Sedell, 1984). Beaver and man too can build dams and other structures in streams, but the effort required is continuous and the energy investment is high.

Increasing populations of animals are observed as areas along roadsides are disturbed. This is not surprising, because the roads provide improved access between disturbed sites and a

trail of browse along the way. New problems with the spread of pathogens such as the blackstain fungus are associated with frequent entry to stands and a dense network of connecting roads (Everett Hansen, Oregon State University, personal communications). The use of poisons to eliminate rodent populations is counterproductive if the eventual growth and survival of planted trees requires fungal inoculum dispersed in the fecal material of animals. Also, any poison that kills small animals may eventually accumulate in the tissue of their larger natural predators or in other non-target species, as we learned with DDT.

Many of the concerns expressed are already appreciated by managers. Somewhat lower stocking of trees is accepted in places where rapid re-establishment of cover is recognized as critical, as on roadbanks or following wildfire. Also, spot use of herbicides and restricted mechanical removal of competing vegetation are growing practices. Partial cutting and replanting under a partly-removed forest canopy are other alternatives being considered.

Logging methods are considerably more gentle now than in previous times. Cable logging is now favored on most slopes over the previous use of crawler-tractors. Also, the locations of landings are selected to make sure they are on stable terrain. But not all loggers work with equal skill and care. And the frequency of access to forests is often high. This means that the landscape's safety features (root strength, vegetative cover, fallen trees, and a full complement of microbial organisms) are not fully restored. In such cases, the resilience of the landscape to a wildfire or major storm is reduced.

Road construction, the most expensive and often the most ecologically damaging of all forest practices in the Northwest, has changed greatly in the last decade. Still, in mountainous regions, roads representing as little as 1% of a drainage often contribute to 80% of the total erosion (Table 3). Roads therefore need to be carefully planned and located to avoid unstable areas. Narrow roads and surfaced roads can measurably reduce erosion. Excess soil need not be cast to the side where it is likely to be washed into streams. Crawler-tractors, which disturb a large segment of the slope, can be replaced with more efficient backhoes that remain at all times on the main roadbed. Nature's approach to softening the impact of water can be copied by placing dead

limbs and other organic debris below culverts. Access can be restricted at times when the roads are soft, except to crews clearing blocked culverts.

Logging and road building still fail in many cases to practice good ecology. The total network of roads is generally too high on our mountain slopes, and their placement and use are uncoordinated. Either better planning and coordination is

"We still have much to learn about our ecological options and limits."

required, or road construction in general must be reduced.

We have an ecological option in the forests of the Pacific Northwest to grow trees, over a period of 50 to 100 years, to a much larger size than is possible in many other regions (Fig. 3). In fact, the option extends for several centuries (Franklin and Waring, 1980). Extension of the rotation age at harvest to a century or even more would allow full recovery of the system's root strength and reduce other problems associated with more frequent disturbance. Longer rotations, of course, expose trees to a greater chance of fire and wind damage. Above a certain size, however, Douglas-fir and cedar trees become resistant to most fires because thick bark protects the stem, and the live branches are far above the ground. Damage from wind, like the dangers of slope instability, is predictable from an analysis of exposure to prevailing winds. Usually ridgetops are the most exposed sites, while valleys are the most protected. The blowdown of a few trees, particularly large trees, is beneficial ecologically, as noted in the discussion of soil formation and stream stability. Excessive blowdown, of course, leads to hazards such as fire and insect outbreaks. A balance needs to be achieved.

We still have much to learn about our ecological options and limits. We need to experiment with new options in eroded areas to see how we can help nature. We would be prudent to save some relatively undisturbed forests as benchmarks and as insurance that a gene pool of native flora and fauna continues to be available. We might focus first on the riparian zone, because the greatest

diversity of life occurs there, and because the linkage to other values--water quality, fisheries, and recreational use--are strong. Here, where any practice that destabilizes will be magnified or muted (Fig. 4), we will see how well our society learns the ecological lessons of the past and molds them to the future.

TABLE 3. CONTRIBUTION OF VARIOUS GEOMORPHIC PROCESSES TO EROSION IN THE CLEARWATER DRAINAGE BASIN IN WESTERN WASHINGTON (Reid and Dunne, 1984). (Used by permission.)

Source	Percentage of annual total for basin
Natural	
Landslides	7
Debris flows	3
Bank erosion	7
Treethrow	2
Burrows	1
Subtotal	20
Road-related ^a	
Landslides	50
Debris flows	11
Gullies, rills, and sidecast erosion	2.5
Secondary erosion caused by road drainage	4
Heavily used roads	9
Lightly to moderately used roads	3
Unused roads	0.05
Subtotal	80
Total erosion estimated at 387 t/km/yr	100

^a Roads represent 1% of the surface in the drainage with 6% receiving heavy use, 44% receiving light to moderate use, and 50% abandoned.

In summary, the Pacific Northwest, and in particular the Coast Range, is unique in possessing a mild climate that permits forests to grow continuously on soils that are enriched by specially adapted plants. The giant conifers adapted to the region have a potential to grow for centuries. This provides unique ecological options to managers and long-term stability to the land and adjacent streams. The region at present is relatively

unsettled and unpolluted. Land zoning and the predominance of storms from off the Pacific Ocean promise to keep the region in a state amiable to growing forests. The production of wood is constrained mainly by unstable soils, and indirectly by the effect of forest practices on wildlife, fisheries, and habitation downstream and in inland valleys. Current research into the way natural systems operate helps us identify options for the future. It also helps us note key features that must be maintained because substitutes are not yet available or economically viable. The situation is analogous to trying to preserve the livability of a city while allowing for growth. We know the goal is desirable, but we are not sure to what extent it is attainable. Wisdom cautions us to go slowly, to conserve the old values, and to experiment carefully with new methods and ideas. With the ecological sensitivity characteristic of the human population of the Northwest, I am optimistic that long-term economic viability will coincide with the maintenance of the region's ecological integrity.

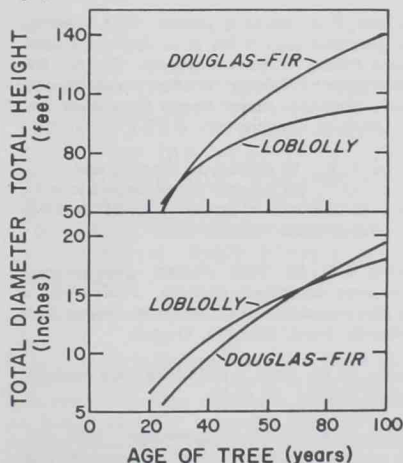


Figure 3. Comparison of growth rates of Douglas-fir and loblolly pine. Pine has a faster, earlier growth rate, but the sustained growth of Douglas-fir results in the latter's eventually overtaking the former (Franklin and Waring, 1980).

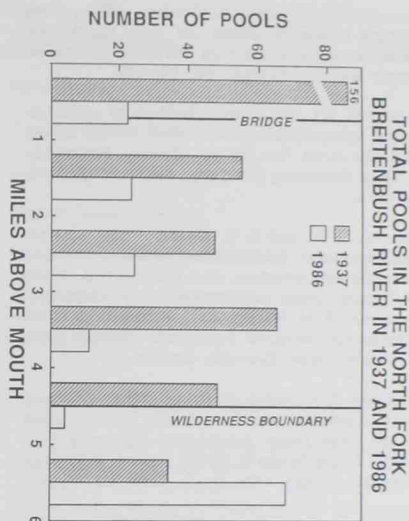


Figure 4. Changes in the total number of pools on the North Fork of the Breitenbush River from 1937 to 1986. The changes were a direct response to salvage logging in the river after the 1964 and 1972 major floods. Pools in the wilderness section doubled in number during the same time span. Data from U.S. Fish and Wildlife Service in 1937 and James R. Sedell, USDA Forest Service. Resurvey 1986, personal communication, Sedell.

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THE TIMBER SUPPLY CONTEXT OF THE LUMBER WAR OF 1986

by

F. L. C. Reed

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INTRODUCTION

The choice for a theme for the 1986 Starker Lectures could not have been more timely. It is certainly "a time for reflection," not just for the forests of the Pacific Northwest but for the forest resource of the entire continent and its varied, dependent communities. The word "communities" is used in the broadest sense to include all those groups relying on the forest for timber and non-timber values.

Indeed, 1986 may well be recorded as the year in which both Canadians and Americans began the most searching examinations of forest policy issues in their history as neighbors.

The commanding issue, we would all agree, is the deadlock over softwood lumber trade, which reached a climax just three weeks ago today. Closely related issues are the allocation of forest land to alternative uses, the rate at which public timber is harvested and at what price, the appropriate level of forest management, and the repair of flawed legal and regulatory institutions on both sides of the border.

Each of these problems must be viewed within the context of timber availability. For this reason the first objective of this paper is to compare Canada's sustainable timber supply with roundwood production trends. The second objective is to summarize my perceptions of the U.S. softwood outlook, especially in the Northwest and the South. This will serve to clarify the timber supply situation in both countries, and especially the supply

"Indeed, 1986 may well be recorded as the year in which both Canadians and Americans began the most searching examination of forest policy issues in their history as neighbors".

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that is available and suitable for lumber production. I will argue that emerging shortages of quality sawlogs are very much in evidence.

The third objective is to explore a resolution of the softwood lumber impasse. May I assure you at the outset that I have no intention of rehearsing the arguments made to the ITC and the ITA by either party. Nor will I examine the merits of the ITA analysis and recommendations. Instead, I will suggest an integrated package approach, not necessarily as a final solution but as a point of departure. This is the first time, to my knowledge, that a two-way package has been discussed publicly in either country.

CANADA'S TIMBER SUPPLY

Background

By a number of measures, Canada is recognized as the world's number-one forestry nation. In historic terms our economy relied on the forest resource as the scaffolding of early commercial and industrial development. The forest sector later evolved into our single most important generator of employment and income. Then in the period after 1950 we became the world's largest exporter of forest products.

"My personal view is characteristically optimistic, but not because of past performance."

These achievements are based on the fact that 79 percent of the combined area of the 10 provinces is classified as forested. This rich and vast geographical base is the source of our great rivers, the habitat for wildlife and fish, and the scenic grandeur that pervades the psyche of every Canadian.

It should follow from these facts that our country is in the front rank by other important measures as well. For example, is Canada first in forest renewal and protection, in forestry science and education, in our capacity to create maximum value from every cubic meter of timber harvested? The answer to these questions is, not yet. Some day it might be true. That will depend on the

success we register in achieving the transition from exploitation of our forests to a mature phase of intensive management.

My personal view is characteristically optimistic, but not because of past performance. This optimism stems rather from the conviction that forestry communities tend to respond only when a supply crisis envelops them.

Forest Inventory

The principal sources of timber inventory data are the provinces. These have been summarized by Bonnor in *Canada's Forest Inventory--1981* (1982). Another issue is scheduled for release next year. Other routine reports are used for production data, while the latest annual allowable cut estimates are based on information furnished by the provinces.

Very little analytical work has been done on the forest inventory on a national basis since the publication of a report by Reed entitled *Forest Management in Canada* (1978). Individual provinces do undertake periodic studies, but these have not been consolidated into a Canada-wide synopsis. So I cannot cite a new timber outlook study that explores trends in delivered wood costs, species mix, quality specifications, and product suitability. These are the critical factors that will determine the competitive capability of any timber-producing region. Unfortunately we must rely on intuitive judgments for the most part, and these are often just a shade better than working in the dark. I am reminded of a quotation from Henry James:

We work in the dark.
We do what we can.
We give what we have.
Our doubt is our passion.
Our passion is our task.
The rest is the madness of art.

In this report, attention will be confined to the provinces that lie for the most part south of 60 degrees latitude. The trees north of 60 degrees are primarily protective in nature and are expected to have negligible industrial significance. The forests south of 60 degrees cover 2.6 million km². Quebec has 24 percent of this area, followed by British Columbia with 22 percent and Ontario with 17 percent.

Every province has a stake in forestry. None has less than 50 percent of its land in forests. The so-called prairie provinces are rich in forests, with 81 percent of their combined land area so classified.

Ownership of this forest is 90 percent provincial Crown. Slightly under eight percent is private and two percent is federal. The latter includes forests in national parks, national defense lands, and Indian reserves. It is important to note, however, that private ownership predominates in some provinces and regions. Virtually all the Prince Edward Island forest is privately owned. Nearly three-fourths is private in Nova Scotia and half is private in New Brunswick. Approximately one-tenth of Quebec and Ontario forests are privately owned. The private share is negligible in Newfoundland and the four western provinces. These ratios remain as they were at the time of Confederation.

Only three-fourths of the forests are "productive," or capable of bearing a merchantable harvest in a reasonable length of time. Classification by productivity is just the beginning of a netting-down process which is necessary to derive an estimate of the forestland available and suitable for industrial use.

Of the productive forest, one hectare in nine is not stocked with a commercial crop of trees. This is often referred to as NSR, or not satisfactorily restocked, and it results from a failure to regenerate promptly following harvest or natural depletion by fire, insects, or disease. In addition, the federal forests are largely reserved for non-timber uses. Provincial parks and wilderness areas now account for about five percent of productive forests in B.C. and a lesser amount east of the Rockies.

However, the single most important reduction in forestland is due to environmental and logging guidelines that effectively set aside 10 to 20 percent of the productive forestland. This reduction embraces fragile sites, steep slopes, higher elevations that are not easily regenerated, stream and lake protection, and landscape logging adjacent to highways and urban centers.

Finally, there are considerable areas that are rendered economically inaccessible by remoteness, high logging costs, low volumes per hectare, or less-attractive species. After all the appropriate reductions are considered, the 1984 Forest and Range Resource Analysis by the British

Columbia Ministry of Forests calculated that only 49 percent of the province's forestland is presently classed as productive, available, and suitable for industrial timber harvesting (1985).

Similar analyses of recent vintage have not been published for all the other provinces. On the

"... earlier estimates of timber availability were seriously overstated."

basis of what is known, however, we can reasonably conclude that as much as half of Canada's forest is what some have termed "de facto wilderness." This is bad news in the sense that earlier estimates of timber availability were seriously overstated. This fact, perhaps more than any other, prompted a neglect of forest renewal and protection by landowner and industry alike.

This new assessment of forestland is also good news in the sense that we now have a more complete and balanced view of the availability of recreation and wilderness land. This should lessen the conflicts between timber and non-timber users. Each party must understand that industrial timber is scarce. It is not "cheap and easy" as was thought to be the case before 1970. Likewise, wilderness and recreation forests are not cheap and easy either. Reallocation can have a serious negative economic and social impact where productive forestland has already been committed to industrial use.

Before passing on to a discussion of sustainable harvest, a word should be said about species mix, upon which timber values depend so heavily. Canada has an international reputation for those high-quality softwood species that make up just 72 percent of our merchantable timber volume. Mixed-wood stands amount to 18 percent, and the remaining 10 percent is classified as hardwoods. The latter are mainly aspen/poplar types, which are relatively abundant compared to available markets and are therefore difficult to harvest and sell profitably. The more valuable high-density hardwoods such as maple, elm, and walnut, were largely depleted several decades ago.

Annual Allowable Cut

The volume of roundwood that may be harvested yearly, on a sustainable basis, from a given forest is known as the annual allowable cut, or AAC. It implies continuous production with the aim of achieving an approximate balance between net growth and harvest, either by annual or by somewhat longer periods. This principle of continuity is known as sustained yield.

Each of the provinces has its own method of calculating the AAC. Differences exist that reflect variations in age-class distribution of a forest, forest management regimes in place, recovery or utilization standards imposed at the time of harvest, and assumptions concerning net growth. Although these variations in method present problems of consistency, the general magnitude of the national AAC can be obtained quickly by adding up the provincial numbers.

During the late 1970's the AAC for Canada was estimated to be 256 million m³, a figure reported by Reed (1978). This amount was reduced to 228 million m³ in *A Forest Sector Strategy for Canada* by Environment Canada (1981). Attempts earlier this year to secure the latest available data from the provinces resulted in a further reduction to 204 million m³. The distribution by major species group is as follows:

	Million m ³
Softwood	166
Hardwood	38
Total	204

"Some provinces have encouraged accelerated harvest levels . . . in order to secure as much volume as possible from stands that are decadent . . ."

It is now widely recognized that the estimates of a decade ago were too optimistic. Hence the reduction in the combined hardwood and softwood AAC of 20 percent. The more obvious factors responsible for lowering the AAC are past neglect of

forest renewal, heavier-than-expected losses from fire and insects, the establishment of parks, wilderness, and other reservations, and the application of environmental guidelines to logging. A less obvious factor is the failure to distinguish between the physical volume of timber on the one hand and its quality or economic accessibility on the other. For example, much of the forest which is remote, at higher elevation, or in mixed wood species, is likely to cost more to recover and process than it is worth.

Still another reason for reducing the AAC, even if delayed, is the large amount of overmature timber that still exists in our forests. Some provinces have encouraged accelerated harvest levels above the long-run sustainable yield in order to secure as much volume as possible from stands that are decadent and declining in value.

This delayed reduction in the AAC is often referred to as the falldown effect, although one suspects that this is a term invented, at least in part, to cloak inadequate forest renewal and protection performance. Harvesting operations are forced into timber stands that are less and less profitable

"The results are more painfully obvious if forest protection efforts fail."

because forestland within easy hauling distance of the mills did not regenerate promptly with commercial species. It is essential, therefore, to discount glib assertions like this one: "We still have 50 or 75 years of old-growth remaining, so why worry?" There is some truth to this statement, but it is also an easy way, surely, to pass along a high-graded resource to unsuspecting future generations.

The results are more painfully obvious if forest protection efforts fail. Canada experienced massive forest-fire losses in 1980 and 1981 and again in 1985 in some regions. Much more serious are losses to spruce budworm, mountain pine beetle, and other insects that prefer a diet of mature timber in stands often scheduled for harvest within the next 20 years. AACs are too often based on assumptions of insect losses that are well below actual experience. The allowable harvest should be revised downward promptly in fully-committed timber supply zones whenever catastrophic losses of this kind occur.

Still another key assumption in calculating the AAC is that a new crop of seedlings will be carefully weeded until it reaches "free to grow" status. If, instead, the competing vegetation is not controlled, because of either scarce funding or a reluctance to use prescribed chemicals, then the AAC should be reduced immediately and the public so informed.

"Even many foresters ignore the near-term benefits that can be generated by intensive management."

Before leaving the AAC, there is another side of the coin that must be examined. Assuming that reductions in the AAC are imminent for the reasons described above, is there any way these can be offset by intensifying forest management? Fortunately, there is a possibility in many cases to capture what is known as the allowable cut ef-

fect. This is not an easy concept for the layman to grasp. Even many foresters ignore the near-term benefits that can be generated by intensive management. The additional timber can often be made available as soon as management is stepped up. Where an adequate volume of mature timber is still available in a timber supply area, it can indeed be harvested more rapidly as soon as the growth of immature timber is accelerated. The old-growth does not have to be stretched out for such a long period when the new crop is managed so as to mature earlier. For example, take a stand that would normally mature in 70 years. This might be reduced to 50 years if the new crop is established five years sooner, if the competing vegetation is kept down, if thinning is conducted at age 25, and if fertilizer is applied at age 40.

The principle underlying the allowable cut effect is basic to the timber production philosophy in the provinces. Simply stated, you can harvest more if you grow more. It also means higher volumes per hectare, more uniform tree size, less decay, lower logging and milling costs, higher

TABLE 1. SOFTWOOD HARVEST AND AAC FOR CANADA (MILLION m³)

	Harvest '83-'84 av.	AAC	Hypothetical Surplus
British Columbia	74.0	75.0	1.0
Alberta	7.5	15.1	7.6
Saskatchewan	2.3	3.9	1.6
Manitoba	1.4	5.8	4.4
Ontario	18.6	23.6	5.0
Quebec	26.4	28.6	2.2
New Brunswick	7.4	7.1	(0.3)
Nova Scotia	3.2	3.4	0.2
P.E.I.	0.1	0.3	0.2
Newfoundland	1.9	2.9	1.0
TOTAL	142.8	165.7	22.9

lumber recovery factors per m³ of logs that are sawn, and higher mill nets when the higher-grade products are sold.

Roundwood Harvest Trends and the AAC

Will there be enough trees in Canada to satisfy the future needs of our present industrial capacity and perhaps allow for modest growth? A first approximation of the answer can be found by comparing the AAC with roundwood harvest. For softwoods, the AAC is now down 19 percent from the figure used a decade earlier.

"The present situation can be described simply as an unfortunate overcommitment."

The softwood AAC and the harvest data is shown for each province in Table I, on the previous page. A few brief interpretive comments will be useful for some of the provinces. First, the B.C. timber harvest is projected to fall by about 10 percent over the next several decades, according to the provincial Ministry of Forests (1985). This reduction points to a falldown in roundwood harvest that will be relatively more serious in the coastal region. A small hypothetical surplus of AAC over harvest will turn rather soon into a deficit. The present situation can be described simply as an unfortunate overcommitment. The evidence was summarized recently by William Young, the recently-retired Chief Forester of British Columbia (1985). In a public address in Vancouver, he described the problem in these words:

The most recent in-depth analysis has projected that B.C. will have a one-third reduction in its annual rate of harvest if:

- forest management investments remain at the current level,
- utilization of the resource remains at the current level,
- the rate of alienation of forest land maintains the historic trend.

Such a one-third reduction would be dis-

astrous for B.C. But it is what can happen! It doesn't necessarily HAVE to happen!

Now to recapitulate the sequence. In less than a decade there was a reduction in AAC from roughly 100 million to 75 million m³. Then we are told by one of our most highly-regarded foresters that a continuation of present policies and practices would result in a sustainable harvest of only 50 million m³.

An examination of what went wrong uncovers five principal reasons. First, the inventory was overstated by including large areas of remote and decadent timber that are not economically accessible and probably will not be for a long, long time. Second, the provincial forest renewal program has never covered the currently harvested area, nor has it reduced the steadily accumulating backlog of neglected land. Third, the ravages of mature timber by insects have been far more serious than anticipated when ceilings on harvest levels were being calculated. Fourth, major reductions were made in the area of timberlands available to industry because of environmental concerns and single-purpose uses such as wilderness and hydro reservoirs. Most of these reductions were made without explicit recognition of their impact on the sustainable harvest.

Moreover, there is a second and equally serious impact of logging guidelines. These have had the effect in many areas of increasing harvesting costs by as much as 20 percent on remaining timber, quite apart from the fact that streambank protection and similar regulations have effectively set aside some of the most productive lands in

"... there is far more to forest renewal than planting."

valley bottoms. This is not to say that environmental constraints are wrong, but rather that their implementation was made without reckoning the negative effect on the economics of timber availability.

When the emerging timber supply problems were documented in the first Forest and Range Resource Analysis back in 1980, the B.C. Ministry of Forests was commendably frank (1980). Targets were established for basic and intensive forestry and funds were pledged to carry out the

work. Just five years later the entire plan was in disarray. The special funds had evaporated and broken commitments were commonplace.

One of the bright spots today is that planting has doubled since 1979-80. However, a good share of this plantation work can be criticized as wasteful when follow-up funding is not provided for brushing and weeding to ensure that the new seedlings survive. Plantation failure rates and millions of hectares of brushed-in sites underline the fact that there is far more to forest renewal than planting.

Reliance on natural regeneration for nearly half our cutover lands is equally wasteful. District silviculturists working for the Ministry of Forests concede that more than one-third of the cutover land left to nature fails to regenerate promptly. Another problem is the shift in species mix that takes place under natural regeneration. The proportion of spruce in the new crop is sharply reduced from what has just been harvested. Balsam fir, lodgepole pine, and aspen types are taking over on many of our B.C. Interior forest sites. Alder often succeeds Douglas-fir and hemlock on the coast. The eventual impact on costs, product suitability, and markets has not yet been fully examined, although it is generally true that reliance on nature will mean longer rotation ages, less volume, and lower quality in the next crop.

Fortunately, there are other bright spots we can point to. In 1985 the province announced a five-year plan that would have set the silviculture target for 1987-88 at \$200 million, compared to \$88 million in 1983-84. Then in May of this year, the Minister of Forests stated in the legislature that the new target was \$300 million. And as recently as September 24, the new Minister of Forests announced funding measures that will go a considerable way toward the \$300 million silviculture goal. These measures call for further increases in planting and a doubling of areas receiving follow-up silviculture treatments. This is timely news.

Before moving on to other provinces, we should note that the British Columbia forest sector is still under an ominous cloud of uncertainty labeled "native land claims." Those claims filed to date cover at least two-thirds of B.C.'s forestland, and others are pending. The potential for both economic and social dislocation is staggering.

Turning to the other provinces, Alberta is the only one where in increase in the softwood har-

vest can be readily achieved. It is likely that Alberta could add 50 to 75 percent to its roundwood harvest as early as the year 2000. Both Saskatchewan and Manitoba appear to be on a production plateau, in spite of their hypothetical surplus of AAC over harvest.

Ontario is more difficult to gauge. It shows on paper a surplus of softwood AAC over harvest. However, some observers suspect that a reduction is imminent, due to the scarcity of second-growth forests within easy distance of the mills, disappointing regeneration performance, heavy losses of mature timber to insects, and a large supply of overmature timber that is difficult to convert at a profit. Recent suggestions are that Ontario will largely forego the use of chemical herbicides and insecticides. This can only result in sharply lower timber production targets. Ontario has set a production record in the 1980's that will be difficult to sustain.

Quebec has just completed a major forestry policy and planning exercise that scales down expectations and places a more realistic set of forest management goals in front of the forest community. Quebec suffers also from overcommitment of the inhabited southern forest, much of which is in private ownership. The province is close to historic roundwood production levels. A reduction will be difficult to avoid in the absence of sharply accelerated forest management.

The four Atlantic provinces taken as a group are roughly in balance when comparing softwood AAC and harvest. New Brunswick has less timber available than is needed by its manufacturing plants when operating at full capacity. Nova Scotia's 1984 Royal Commission on Forestry predicted

"On balance, Canada will never run out of trees. The more sensible question is whether we can have an assured supply of industrial softwood . . ."

ed a softwood deficit around the year 2000. Newfoundland's forest is fully committed and the province may even face a deficit if some way is not found to cope with major insect losses. Prince Edward Island is endeavoring to rehabilitate its farm woodlot resource, a job that will obviously

TABLE 2. SOFTWOOD TIMBER PRODUCTION AND AAC FOR CANADA (MILLION M³)

	Softwood Production	AAC
1950	86	
1960	93	
1970	109	205
1975	103	
1976	128	
1977	133	
1978	143	
1979	147	
1980	141	
1981	131	174
1982	114	
1983	142	
1984	144	
1985	150	166

take some time. Table 2 provides an overall comparison of AAC and harvest for the 10 provinces.

Summary

On balance, Canada will never run out of trees. The more sensible question is whether we have an assured supply of industrial softwood that can be delivered to the mills at competitive cost. Clearly there are deficits in economic terms already, in every region. These are expressed initially in a shortage of prime sawlogs, as we see on the B.C. coast now, as well as in Saskatchewan and in some parts of central Canada. There seems to be little hope that we can avoid a reduction of at least 10 percent in sawn lumber output over the next decade or so.

Can anything be done to forestall the indicated retrenchment? Yes, but once again it will not be cheap or easy. A judicious combination of accelerated forest renewal, enhanced protection, and closer utilization in the woods and mills alike could lessen the short-term downside pressure. In the longer term of course, say, after the year 2000, the future is what we care to make it.

Less needs to be said about the hardwood timber supply. The aggregate AAC in the 10 provinces is more than four times the annual harvest. The constraint here is not on the supply side but on markets.

What we have seen then is a near-doubling of Canada's roundwood harvest in the postwar years. These are impressive gains, but they show evidence of coming to an abrupt halt during the current decade. The second message is that the euphoria of 1970 has vanished. In that year we saw the potential to double production, and we set out with carefree enthusiasm. By 1986 it is clear that the softwood timber supply is not inexhaustible. We recognize instead that we have reached an upper limit, temporarily.

I say "temporarily" because it is my firm conviction that the opportunity exists to reaffirm the earlier AAC goal in excess of 200 million m³. But that will take a doubling or tripling of forest management expenditures. The political will for such a commitment has yet to be demonstrated.

U.S. TIMBER SUPPLY

Background

It is not necessary with this audience to devote as much time to the U.S. softwood resource as is given to Canada's. I will simply highlight my perceptions of the supply in the main U.S. timber-producing regions. The approach is to begin with the most recent outlook study of the U.S. Forest Service (1982). We find in that report a great deal of reference material, including projections for the period up to the year 2030. Table 3 summarizes the U.S. softwood timber harvest for 1952 and 1976 and compares these benchmark years with the projection for the year 2010.

The next few paragraphs will indicate how new analyses and a shift in assumptions have led to a

TABLE 3. U.S. SOFTWOOD TIMBER SUPPLY ACTUAL AND PROJECTED (MILLION M³)

	1952	1976	2010
Pacific Coast	90.0	107.9	107.1
Rocky Mountain	11.0	21.5	33.1
North	19.2	17.5	31.1
South	82.7	118.4	191.7
TOTAL	202.9	265.3	363.0

Source: U.S. Forest Service, Report No. 23, 1982 (Adapted from Table 8.3).

marked downward revision in the projected softwood supply over the next two or three decades. The factors pointing to lower availability targets are as follows:

- Shrinkage of the forestland base
- Management of non-industrial private lands
- Growth and yield projections
- Age-class distribution
- Inventory volume trends
- Product suitability of plantation timber

South

The most notable among these projections is for the South. It indicates an increase for the period from 1976 to 2010 of 73.3 million m³, which is just slightly under the current production of British Columbia. This won't happen. A task force has been reexamining the South for two years and it begins to look as though that region is approaching a plateau. In fact, there are indications that the reservoir of sawlogs in the old "natural pine" forestland category, which is crucially important to current lumber production, has been drawn down steadily since the early 1950's. By 2000 there will be little of this natural pine lumber left. Moreover, the loblolly pine plantations are designed primarily for fiber products, not for lumber.

"The projected decline in sawtimber availability in the Pacific Coast states now appears to be starting sooner and headed for a deeper trough than was expected in 1982."

The reasons for this sharp downward revision were discussed by R. Max Peterson in a recent article in the *Forest Farmer* (1985). His account of the potential impact reads in part as follows:

... the general implications are very clear. There is a very large softwood inventory, and this can sustain the existing plant capacity for a time. But the volume of timber harvest will inevitably fall as inventories are reduced ...

Peterson goes on to say that there could be plant closings, that prices of softwood stumpage will rise, and that consumers will be adversely affected.

Until the Southern task force reports early next year, it would be prudent to assume that any increase in sawlogs is highly unlikely for the region as a whole. On the contrary, retrenchment is a real possibility in numerous communities.

Pacific Coast

The projected decline in sawtimber availability in the Pacific Coast states now appears to be starting sooner and headed for a deeper trough than was expected in 1982. This region will experience a sharp reduction in sawlog availability which has been predicted for the last 15 to 20 years. The reduction will be worsened to the extent that additional large areas are set aside for spotted owl and other non-timber use under what are known as minimum management requirements.

Should these reductions go ahead as planned, there could be a reduction of 20 to 25 percent in National Forest timber supply in Oregon and Washington, according to a paper earlier this year by James Geisinger (1986). Half this drop is due to spotted owl or other wildlife constraints. William Atkinson, of the University of Washington, stated recently that the reduction of timber harvest on the west side of Region 6, for public and private forests combined, could be as deep as 25 to 30 percent over the period between 1995 and 2010 (1985).

Rocky Mountain and Northern

The projected increases from 1976 to 2010 in softwood availability in Rocky Mountain and Northern states (54 percent and 78 percent, respectively) are likewise regarded as excessively optimistic, given the institutional and economic constraints that are laying a heavy hand on incremental supply.

In short, for the U.S. as a whole, it is evident that the projected 1976-2010 growth of 97.7 million m³ (shown in Table 3) should not be anticipated. In terms of product suitability, moreover, it is my view that the U.S. is in the same situation as Canada with respect to sawlog supplies. Both are facing substantial reductions in volume of prime old-growth sawtimber. Although the

outlook for fiber logs is relatively more optimistic, the likely transition path to successive decades has not yet been adequately defined for either country. Trade policy formulation is a treacherous business in these circumstances.

HISTORIC ROOTS OF DISCORD

The Tension Wood of Trade Relations

When colonists first landed on our eastern shores they found the world's most valuable coniferous forests. The extent and richness of the white and red pine were legendary. Who could have foretold that this resource would provide the perennial "tension wood" of Canadian-American trade relations?

We might just as well ask here today, how many in this room recognize the single greatest irritant in over a century of our trade relations? Yes, the culprit has been softwood lumber, a subject of dispute that recurs with tiresome regularity throughout our common history.

Even a casual reading of our trans-border relations quickly exposes the forest and its exploitation for timber products as a locus of friction. An excellent source of material on this subject is found in Arthur Lower's magnificent volume entitled *The North American Assault on the Canadian Forest* (1938). Professor Lower traces these disputes back to Maine and New Brunswick in the 1820's, where the disputed forest territory along the Aroostook River and the Upper St. John threatened for many years the peace between our countries.

Another early timber controversy raged just before the Civil War. In 1853 an Ohio Congressman named Townshend spoke in the House of Representatives on a trade bill (1853). His remarks bear an astonishing resemblance to those recorded 130 years later in the current trade debates:

... The British Provinces have almost inexhaustible supplies of pine lumber. This is greatly needed. ... But Maine, from which a large share of the best timber is already cut, wants to exclude the lumber of the Canadas, and to force her [Maine's] spruce and inferior pine on the market at high prices. It is asserted, that unless competition from the Provinces is prevented, and the absolute monopoly of the

trade be secured to Maine, her hardy lumbermen cannot make fair wages, because as they express it 'stumpage is so high'. ... It is the monopoly of the trade excluding foreign lumber that enables the Maine landholders to charge so much for stumpage. Increase the duty on imported timber, and stumpage will rise still higher; reduce the duties, and then stumpage will be lower. Prices regulate stumpage, and the lumbermen will not be affected whether stumpage be high or low. The hardy lumbermen, over whom tears are almost shed, are not benefitted in the least, but rather injured by the high duties; and all this humbug of protection is not designed for their benefit but for the benefit of the wealthy few.

The congressman's views evidently prevailed, for the Reciprocity Treaty was signed in 1854. It opened the borders to all natural products and unmanufactured raw materials until 1866. Upon the treaty's demise, a tariff of 20 percent was imposed on Canadian lumber. Canada countered with an export duty on pine sawlogs exported to the U.S., starting at \$1 per thousand feet. The duty was increased to \$3 by 1888. In 1889 the McKinley tariff bill reduced the American duty to \$1 per thousand, while in 1897 the Dingley tariff restored it to \$2.

The tariff battle swung back and forth. In 1898, Ontario embargoed log exports to the U.S. Other provinces followed suit. For decades there was virtually no export of softwood logs to the U.S. Under the Canadian Constitution Act of 1867, the provinces were given most of the unsettled forestland in Canada, with the sole right to manage it and to sell the timber therefrom. The same provincial mandate prevails today.

The prohibition of log exports was referred to as "the manufacturing condition." The policy was intended not simply as a retaliation, but rather to ensure that the U.S. mills that had been idled by a depleted resource would not simply go north of the border, liquidate the Canadian pine woods, and leave the vital sawmill industry in ruins. Incidentally, the same logic is used today by the U.S. Forest Service and the province of British Columbia. Both are acting to prevent the public forests on the Pacific Coast from being quickly stripped by the voracious appetites of wood-processing mills across the Pacific.

Much more could be added to this partial account of the continuing lumber war. For example, the Smoot-Hawley tariff of 1930 virtually closed the U.S. border to Canadian lumber. The next big effort to curtail Canadian lumber came in a U.S. Tariff Commission hearing on softwood lumber in October of 1962. While the Commission refused to recommend a tariff, the protectionist efforts

"This time around, many on both sides of the border are asking penetrating questions . . . Is either country well-served by the machinery in place to solve disputes?"

continued in the form of proposed marking regulations and others.

Then in 1982-83, a U.S. countervail duty action failed. A repeat of the same charge in 1986, under different rules, appears to have succeeded.

Reflection on the Present Impasse

This time around, many on both sides of the border are asking penetrating questions about the institutional framework that governs our trade relations. Is either country well-served by the machinery in place to solve trade disputes? Does the costly and time-consuming adversarial process of pitting the opposing sawmill industries against each other provide the most efficient way to settle a major problem? Are the public timber marketing systems not seriously flawed in both countries?

These are only a few of the questions that could be posed by thoughtful observers of the present impasse. Many of these questions would take months and even years to answer fully. There must be a shorter and more practical answer. In the next few pages I will suggest an entirely new approach, based on three steps. The first is to seek common ground with regard to the outlook for softwood sawlogs in Canada and the U.S. I tried to clarify the sawlog picture in the two forest sections of this paper. A perceptive company president once told me that "your wood tells you what to do." Given the present sawlog supply in

North America, a tariff on softwood lumber is absurd. However, that does not imply that I favor the status quo for other policies.

The second step is to clear away some underbrush created by the failure of economic analysis. Economists have contributed more to the present confusion than either politicians or vested interests in the private sector. The third step is to present a resolution of the softwood lumber dispute, a resolution that would impose painful decisions on both countries. The fourth and last is to reflect on a few of the differences that characterize the average citizen, both yours and ours. This final perspective is more philosophical in nature, but I believe it will contribute to a new and more conciliatory mood.

THE FAILURE OF ECONOMIC ANALYSIS

Blind Alleys and Open Prospects

Some time ago, Colin Price, a forester in Wales, wrote a splendid article entitled, "Blind Alleys and Open Prospects in Forest Economics" (1986). He spoke of the dismal performance of forest economists in handling non-priced forest values. Here is a short extract from his paper:

. . . panic-stricken by the sight of economic arguments, foresters have bolted up blind alleys, where they have buried their doubts under an impressive pile of misconceptions.

The purpose of this short section is to show how economics have contributed to blind alleys in the lumber trade debate when they could have explored what Price has termed "open prospects" and "patches of truth." I am reminded of a remark by Frank Knight, a respected economist of the last generation. He said that sometimes it was hard to tell if economics was a job or a racket. He also remarked that when economists passed each other in the street, they did not know whether to laugh or cover their faces.

All joking aside, economists do their best work when they focus on historical analysis and description, and their worst when they try to predict the future. The next section raises questions that have not been adequately addressed by the economics profession.

Basic Questions

1. What is the chief feature of the economic history of the forest sector? The answer comes back loud and clear: a mobile industry chasing a vanishing resource. Sustained yield is still far from universal in either of our countries. The industry eventually finds a way to accommodate itself to depleted resources by means of new technology, by utilizing less-attractive species, and by moving over the next range of hills. But an interval of dislocation for both people and communities has been taken for granted. We need to recall our past.

2. What was the effect on the lumber trade of the U.S. anti-inflation policy of the early 1980's? All of us can trace the impact of tight money on credit-sensitive industries, and thereby on the North American lumber industry. However, few are likely to recall that the same policies caused the U.S. and Canadian currencies to leap upward in relation to those of our offshore trading partners, forcing our respective lumber producers to back out of overseas markets and to overload the domestic market.

3. Has the Jones Act been one of the influences that has encouraged U.S. investment capital to locate in the B.C. lumber industry? In a word, yes, although the extent of this influence has not received detailed scrutiny by economists.

4. Has the reallocation of National Forest timberland to wilderness and wildlife habitat pushed lumber production into Canada? Will a further designation to spotted owl and other wildlife heighten this pressure to increase the Canadian share of the U.S. lumber market? This is a new kind of tradeoff with an international flavor: the U.S. gets enhanced wilderness values and Canada gets a larger share of continental lumber markets. Economists have not published much on this aspect of the lumber controversy.

5. Does the increase of roadless areas and wildlife set-asides have any influence on stumpage prices? What about the application of rigorous environmental guidelines? The answer again is an all-too-obvious "yes." Economic analysis linking these programs to stumpage levels is not part of the evidence that has been sifted in the softwood

lumber case.

6. Does the theory of economic rent have anything useful to say about costs and prices? Perhaps, but it is certainly not obvious in this case. Some have argued that the stumpage charge is a residual one, and by definition cannot be considered an element in costs or an influence on lumber prices. The answer to that can be very short. Show me one Canadian or American producer who disregards stumpage when he calculates the feasibility of investing in a sawmill, or who ignores stumpage costs when he offers lumber for sale.

7. Are markets for public timber freely competitive in either country? The answer is, rarely. One seller makes a monopoly. A relatively few buyers make an oligopsony. There is a large measure of free competition in the wholesale markets for lumber, but certainly not for public timber. The cutthroat competition of speculative bidding is a caricature of free competition.

8. Will a 15 percent tariff force up the price of stumpage in the Pacific Northwest? If so, will the higher stumpage nullify the lumber price increase resulting from the same tariff?

Economists have studiously avoided these questions. Congressman Townshend did not.

Compensation

Another aspect of the wilderness-stumpage-tariff triangle is that of compensation for innocent bystanders. Society has a right, of course, to decide that timberland should be set aside for spotted owls and not harvested. But society then has a responsibility to mitigate the resulting losses suffered by those in a forest-based community. These losses include the financial setbacks to companies that planned their corporate strategies around a stable supply of timber.

In the final analysis, however, the real losses are experienced by people. Incomes shrink, jobs disappear, real estate values plummet, and small businesses fail as the economic engine under a sawmill town sputters to a halt. Are these people entitled to a just compensation, or simply to food stamps and welfare?

The case of the California Redwood National Park can be used to illustrate the concept of

compensation. Industry was paid for the loss of valuable timber. More importantly, the displaced workers in the affected communities were allotted approximately \$100 million to reimburse them for loss of income and to ease the transition to alternative work. That is one way to at least partially restore the playing field to a level condition.

Undoubtedly there are other examples of compensation, just as there are in Canada. They are not numerous, but the principle is being adopted more widely. A recent example is contained in *The Wilderness Mosaic*, a report of the Wilderness Advisory Committee that examined 24 locations in British Columbia, including 16 candidate wilderness areas and eight existing parks. The report was published by the province's Ministry of Environment (1986). As a member of that committee, I can assure you that compensation was a central issue in every public hearing and in deliberations on each of the 24 locations. A section of the report reads as follows:

The Committee heard many views on the subject of compensation . . .

The Honourable Thomas MacMillan, Federal Minister of Environment, has stated his support for compensating forest employees as well as forest companies. Parks Canada also expressed concern that changes in park boundaries and new designations should not negatively affect people in the region. Other public figures, as well as spokesmen for both preservation and development, have stated their support for compensation. . . . To compensate only those with unequivocal rights in law could be insufficient from a moral and social viewpoint, . . .

In its deliberations, the Committee sought recommendations that implied no net loss to dislocated resource users. Where this was not possible, direct compensation for losses could be a substantial consideration. Indirect losses might be resolved by compensation but might also be addressed by government programs to stimulate the affected local economy, such as through investment in intensive forestry practices, diversification of business activity and other means.

The potential for expanded forest growth through intensive forest management could

well become one of the most important long-term means of reducing social impact where forest land is designated for wilderness and parks.

The issue of compensation is often downplayed by protagonists in the wilderness controversy. Some even say they are sick of hearing about jobs, a comment reminiscent of the old thumbs-down signal in the Roman Colosseum. Compassion was not in their dictionary, and it is sobering to reflect on its absence from so much policy formulation today.

The Dismal Science

To conclude this section on the failure of the dismal science, the lumber trade controversy has not been well-served. Even when various economists do address an issue such as the potential impact of a 15 percent tariff, their findings are inevitably poles apart. They provide no usable consensus for trade policy people on either side of the border. Barrington Nevitt (1986) puts it this way:

Hitherto experts have been shining the light of their knowledge into each other's eyes, and ours, rather than pointing it at the dark ground of everybody's ignorance.

One of the basic weaknesses of modern economics is the preoccupation with the criteria of economic efficiency and a lack of interest in conservation. The latter is a longer-term concept that focuses on our children and on succeeding generations. It is a patch of home truth that is crying for attention, along with the eight questions listed above. Answers to these are implicit in the recipe offered in the next section.

RESOLVING THE IMPASSE

A Foregone Failure

The opposing lumber industries have now expressed themselves in a test of strength that leaves them exhausted, and that leaves us with a tentative 15 percent countervailing duty on Canadian lumber exports to the U.S. Neither side has won in what is essentially a "lose-lose" recommendation of the International Trade Adminis-

tration. The search for a compromise began seriously only in early September, and the efforts so far have been inconclusive.

Failure to reach a solution is not due simply to stubbornness on the part of the industry protagonists on both sides of the border. More specifically, U.S. trade legislation has often left U.S. producers with a feeling of futility and a perception that legitimate requests for relief were being ignored in Washington. National Forest timber policies and the related planning process have yielded little comfort to a beleaguered industry. On the Canadian side, the response to U.S. pressures has been filtered through an incongruous system of jurisdictions involving two levels of government and a fragmented private sector. The ball has been carried primarily by the Canadian forest industry but with no clear delineation of accountability. It is easy to understand why the impasse has arisen.

A New Direction

Room for accommodation exists in both countries. The search for a two-way resolution of the impasse leads first to an integrated set of Canadian components. These should be adopted by reason of their inherent common sense, and not just because the U.S. is pressuring us. They correspond neatly with the goals of a prudent forestland manager who realizes that Canada has been harvesting its timber at a more rapid rate than is justified under accepted principles of sustained yield. The sawlog supply in particular is being depleted at a faster pace than it is being replaced under existing levels of forest management. A reduction in lumber output is clearly in prospect in various regions.

The steps proposed below are essential to ensure that Canada can become a reliable, stable supplier over the long run. While they should be done for our own benefit, the adoption of these items would help to address the gap in forestry and stumpage costs, which is a major cause of the tension in the lumber trade.

Canadian Side

1. Reduce the current harvest levels of sawlogs.
 - Set sawlog AAC at levels consistent with forest renewal and protection.

2. Raise stumpage charges

- In B.C. this means updating lumber recovery factors and chip prices in the appraisal formula.
- In all provinces, stumpage should be no lower than the cost of forest management.

3. Increase forest renewal spending

- One option is a silviculture levy earmarked for forest management.
- Set minimum target of doubling over five years.
- Then review AACs again in light of performance.

4. Enforce existing regulations

- Enforce ceilings on Annual Allowable Cut.
- Enforce utilization standards in the woods.

5. Export some roundwood

- Consider a little more flexibility.
- Expand "standing green" sales in areas where costs are too high for domestic mills, which means the North Coast.
- Set maximum volume subject to regular review.

Loss of employment in sawmills can be offset in large part by doubling silviculture programs and by generating logging employment through modestly higher exports of logs.

U.S. side

The suggested U.S. package includes a number of concessions that Washington might consider, quite apart from trade disputes, given the serious shortages of mature sawlogs that are appearing in various regions. Moreover, the U.S. government contributed directly to the shifts in exchange rates in its successful war against inflation. There is no question that the resulting realignment of currencies was detrimental to U.S. lumber producers trying to sell in both export and domestic markets. This problem was largely created by unilateral policies conceived in Washington. Washington should assume some of the responsibility for repairing the damage to domestic sawmill operators.

1. Increase timber sales offered

- Increase sales especially in U.S. National Forests in Pacific Northwest.

- Raise Forest Service budgets sufficiently to support this.
 - Ensure that U.S. mills will have a stable supply of sawlogs rather than face a decline.
2. Extend timber contract relief
 - Continued high levels of default can be avoided.
 - Timber locked up in high-priced, inoperable sales can be returned to timber supply.
 3. Maintain and improve tax climate
 - Reconsider the demise of timber capital gains; phase out over extended period.
 - Extend the expensing of silviculture disbursements in the year they occur.
 4. Halt shrinkage of industrial forestland base
 - Shelve forest plans that will seriously reduce commercial forestland base.
 - Review forest practices legislation and regulations that isolate large areas of commercial forest.
 - Reduce level of litigation on environmental side.
 5. Extend the practice of stumpage rate adjustments during cyclical troughs
 - Apply to old sales as well as new, as is done in some timber sales now.

These five items on the U.S. side will alleviate the projected decline in timber supply, especially in the Northwest states. They will also tend to influence the stumpage costs downward and contribute thereby to closing the gap referred to above. They would provide a breathing spell of, say, five years of relative stability in timber supply as well as in stumpage.

Joint Items

There is another set of items that complement those listed above. These are joint projects. Each of them focuses positively on solving problems common to both countries.

1. Joint task force on timber supply
 - Neither country is well-informed on continental timber supply.
 - Accelerate analytical work on regional softwood supplies in U.S. and Canada.

2. Reinforce joint projects
 - Promote trade, both export and domestic.
 - Develop new grade standards.
 - Develop new products.
 - Collaborate on fire suppression.
3. Research collaboration
 - Collaborate on disease and insect control.

In addition, Canada should be encouraged to implement a five-year RPA-type Assessment of forest resources along the lines of the U.S. one. This would provide the context in which a timber supply-demand strategy might be designed. Neither country can formulate sound forest sector policies or design sensible forest renewal programs when a mutual understanding of the resource base is lacking.

Cooperative effort along the above lines is not new, although it was accelerated in the early 1980's. This is especially true of timber supply analysis, for which a special task force was set up in a memorandum of understanding between the U.S. Forest Service and the Canadian Forest Service in 1983.

It is vital that any new positions on trade in forest products be based on a frank assessment of the availability of sawlogs and shingle material in both countries. If we accept that serious shortages of timber are beginning to have an effect on timber supply in North America, then it follows that action on the trade policy front should

" . . . neither side should insist on unconditional surrender."

take this availability fully into account. Otherwise, the industry and its customers could suffer unnecessary damage in both countries.

Strategy

The package described above should have a reasonable chance of prompting a thoughtful examination of its merits by both governments. Its components have been tested informally in both countries. There are those who would like to see a

discussion develop along the foregoing lines.

The roles of key players are changing at this stage. Industry spokesmen on both sides have become deeply entrenched. It is unlikely that they would come back to the table with a clean slate. That is hardly their job. A fresh start is called for, one that shifts the main responsibility for a resolution over to the governments in Washington and Ottawa. The industry, as well as provincial governments, will wish to maintain an advisory role. The importance of presenting a balanced two-way package is underlined. This is especially true for Canada, where a fair share of the adjustment burden must be seen to fall on the U.S. government. But neither side should insist on unconditional surrender.

Similarly, the U.S. sawmill owners have gone the tariff route in part because of their frustration with the U.S. Forest Service and other federal agencies. Their pleas appeared to have fallen on deaf ears. Some concessions by the U.S. government would certainly lessen the pressure for a punitive tariff, even at this late stage. If these concessions were coupled with Canadian moves of substance, then it is conceivable that the pressure for tariff protection could be eliminated entirely.

A crucial element in this strategy is the introduction of the timber supply issue. A small but high-level working group could scrutinize timber availability in both countries, and at the same time explore the positive ground outlined earlier under joint projects. There is far too much emphasis on adversarial aspects at present. Emerging timber deficits have not had the attention they deserve.

This suggests, in turn, the possibility of returning to the dual envoy concept. There are many people who believe the envoy concept was valid and who were disappointed with the rapid shelving of the idea earlier.

The package components should not be dribbled out in piecemeal fashion. It is important that both countries have a complete set of integrated moves, and that these have the appearance of balancing each other. For example, the U.S. timber capital gain item would have been a valuable part of the U.S. package. Perhaps it is not too late to suggest that it be phased in.

The Stakes

The impact of a full-scale trade war on the

Canadian lumber industry and its workers would be calamitous. A compromise might still cause limited curtailment in logging and milling, but some of this would be offset by the creation of hundreds and perhaps thousands of jobs in Canadian silviculture activity.

Moreover, to the extent that a more responsible forest management program is evident to investors, the economies of forest-based communities would benefit by new projects of various kinds. A reliable raw material supply must be demonstrated in order to draw funding into "value-added" projects, as well as the routine upkeep of existing manufacturing facilities.

So the stakes in Canada include better stewardship of forest resources for stable, long-term

"The farther we depart from a market-based solution, the more likelihood there is of major and unforeseen dislocations."

economic growth, and the enhancement of direct and indirect employment in other directions.

In the United States, the benefits of a compromise package can also be measured in terms of gains in employment and industrial stability. But there is another factor that goes virtually unnoticed in demands for protective tariffs. The consumer of forest products has not been heard from in consistent terms.

This raises another vital question: what will be the impact on prices paid by the consumer after a 15 percent lumber tariff? Will it be five, 15, 25, or 50 percent? If there is indeed a looming shortage of sawlogs in the U.S., a relatively small constraint placed on lumber imports could have a much larger impact on lumber prices and stumpage.

In short, the farther we depart from a market-based solution, the more likelihood there is of major and unforeseen dislocations. The U.S. lumber industry is taking an unusual risk by demanding a high level of protection against a background of raw material uncertainty. There is a measure of discredit already evident in the shingle and shake

tariff, where the Washington State producer is clearly without a secure domestic supply of cedar.

Just a few short months down the road, new RPA and U.S. South timber analyses are expected to indicate potential shortages of sawlogs on the immediate horizon. The same situation is already evident in Canada. Care must be taken to avoid raising false expectations concerning timber availability in the medium and longer run. A blunder here would discredit industry and government alike.

Finally, a major increase in softwood lumber prices will certainly please competitors with steel, aluminum, and other substitutes. Someone should be taking the longer view. At the same time, the consumers might be asked what they think of prices forced up by tariff barriers. They also have votes.

ÉPILOGUE

That Elusive Essence of Canadianism

This paper has dealt at length with heavy subject matter. In closing, may I invite you to consider another perspective from which to ponder our conduct as neighbors. Why do Canadians behave as they do? How are they motivated?

For answers to these questions you might refer to an essay entitled "Sharing the Continent," by Northrop Frye, Canada's dean of letters (1982). Another source is *Survival*, a book by Margaret Atwood, one of Canada's better-known authors (1972). It is a fascinating subject. I can only highlight in the briefest way some of the goals, values, traditions, and influences that shape our national psyche, elusive though it may be.

Yes, Canadians are similar in many obvious ways to Americans. Most Canadians have friends or relatives in the U.S., and in casual contact it is generally assumed that we are very much alike. That is true in several important categories, such as our high regard for the integrity of the individual, our deeply-felt respect for minorities, our democratic institutions, and a large measure of overlap in our cultural heritage. And it is true in superficial terms, like the clothes we wear, the cars we drive, and the food we eat.

At the same time, those Canadians who have lived, worked, and studied in the United States recognize that we differ in fundamental ways. Small wonder, then, that we often choose quite different solutions to political, economic, and social challenges.

The Psyche

Frye begins his essay with students leaving a schoolyard. Perhaps you can tell the Canadian students by their physical carriage, he says. Contrast this with the American students who have been taught from earliest years that they are citizens of the world's greatest power. There you see pride and patriotism in the very stride, while in Canada the certainty is often missing and the pace tentative.

"The central symbol in Canada is survival . . . Success for the hero of the story was not to reach the goal, but just to get back home alive."

This difference is further elaborated by Atwood in terms of symbols that can be used to characterize the state of mind. The central symbol in Canada is survival, as evidenced throughout our literature and art. In our earlier history this meant survival from the hostile elements. Success for the hero of the story was not to reach the goal, but just to get back home alive (Atwood, 1976).

Anxiety is a perpetual condition associated with a preoccupation with staying alive. Many Canadians see this symbol extended in recent decades to cultural policy. The victim is now anxious over the threat, as he sees it, to cultural survival. A garrison mentality tends to foster hopelessness.

In sharp contrast to this is the American symbol of the frontier. It speaks of conquest of virgin territory, the golden west, a new beginning, and endless promise. When the geographic frontier is conquered, there is plenty to conquer in science and in space. Optimism is dominant except for brief periods which are quickly forgotten.

The Geography of Nationalism

Another difference is that of geography. It has been noted that Canada is like Chile laid horizontally, that our communities remind one of a rural clothesline on which various items are attached by temporary pegs. The vast distance east to west is measured by four and one-half time zones. Canada is a land of solitudes, of separations, and all

" Canada is like Chile laid horizontally . . . our communities remind one of a rural clothesline on which various items are attached by temporary pegs."

this is overlain with the vast, silent North.

Is it any wonder that another shaping force in our national identity has been the drive to close the communication gap with nationalized railways, media networks, airlines, film boards, and subsidized cultural industries? This is not thought to be an excessive price to pay for the preservation and enhancement of a national identity. In short, Canada's geography makes us vulnerable in many respects, and prompts a set of policies that would never occur to a country blessed with ideal geographical balance.

Political Traditions

In 1776 the infant American Republic set about the task of drafting Articles of Confederation. They soon discovered that a confederation would not work. Just 12 years later they replaced the Articles with a new Constitution, and the United States of America became a reality.

In 1867 the Canadian Confederation was born. Someone forgot to tell us it would not work. The choice was deliberate to forego union on the American model in favor of a less rigid association. Perhaps the most significant principle agreed to in the Canadian Constitution Act of 1967 was that of provincial rights. The provinces were given Crown lands, and especially forest lands, in order to give them some control over their economic destiny. Section 92 of the Act gave exclusive authority in relation to:

The management and Sale of
Public Lands belonging to the
Province and of the Timber and
Wood Thereon.

More recently the Constitution Act of 1981 was proclaimed. Of particular significance is Section 92A.b, which specifies that each province may exclusively make laws in relation to:

. . . development, conservation and management of . . . forestry resources in the Province, including laws in relation to the rate of primary production therefrom.

That explains in part the dilemma faced by Canada in the present lumber dispute. The federal government is responsible for trade policy and international trade negotiations. The provinces retain the sole right to determine stumpage charges, annual rates of harvest, and the level of forest renewal.

So I urge you not to lose patience with Canadians. Our Constitution is as sacred as yours. We will just have to persevere for a while longer. At the same time, we will try not to lose patience with your system, where your President is instructed on trade policy and on trade legislation by a Congress with a mind of its own. The Canadian Prime Minister has much more freedom to set policy, to pass legislation, and to take decisive action. Up to a point, that is, because he must not interfere in a provincial forestry matter without that province's consent.

Compromise

Canadian history shows time and again the genius of Canadians for compromise. To illustrate, we experienced an ambiguous birth, have evolved as a bilingual country in a multi-cultural milieu, and have recently survived a Quiet Revolution in Quebec. The practice of reconciliation has become a national habit. This fact was described in a *Toronto Globe and Mail* editorial on our latest national birthday (1986):

Nation-building in these circumstances must always acknowledge variety in a free society without losing a sense of the common fate. Over and over again we are asked to recon-

cile regionalism with nationalism, multiculturalism with bilingualism, state intervention with market forces and sovereignty with unusual dependence on the outside world--in our case a huge and dynamic United States. It might be said that reconciliation is the main business of Canadians as Canadians, not a bad boulder to roll uphill for eternity, though it rarely offers the thrills of conventional nationalism.

Common Ground

This genius for compromise is not unknown in the U.S. either, although it has yet to be tested in the ongoing lumber dispute. Enormous time and effort has been expended on the countervailing tariff process. This can only be regarded in hindsight as a tragic waste.

Perhaps it will help to position us philosophically for the task ahead if reference is made to a great Canadian patriot, one who was well-known in both countries over a century ago. I speak of Joseph Howe, who delivered a memorable oration at a festival in the summer of 1871 at Framingham, Massachusetts. A wise nation, he said, remembers its past, repairs its institutions, and fosters unity. That advice is equally valid today as we strive with yet another crisis in our trade relations.

Let us hope that the time has now arrived to turn our combined creative energies to a search for common ground. We can say we have failed only when we stop trying.

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MULTIPLE-USE FOREST ECONOMICS

by

John V. Krutilla

"A national forest . . . meant to me a massive expanse of magnificent large conifers almost to timberline, and massive permanent snowfields beyond."

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Many of you have been deeply involved with the Oregon National Forests. Some of you are woodworkers. Others, perhaps, have had a different kind of association, principally through recreational experiences. Whether the relationship has been intimate or casual, it is still possible that you may have a limited perspective on the National Forest System, one that is as limited as the one I held for a very long time. In my youth, growing up in a small community not far from Tacoma, and attending college in Portland, I grew up literally in the shadows of the North Cascades. Aside from

" . . . National Forest lands may be . . . not of commercially productive quality."

Mount Rainier, the Cascade mountain range was virtually all contained within the National Forest System. A National Forest, then, meant to me a massive expanse of magnificent large conifers almost to timberline, and massive permanent snowfields beyond. Thus the U.S. Forest Service represented to me an agency deeply involved in managing timber while accommodating the skiers as an amenity on the side. It came to me somewhat as a surprise to learn, upon more serious involvement, that the National Forests in this region, sometimes referred to as the Doug-fir region, were anything but typical of the forests in the National Forest System.

To gain perspective on the nature of the National Forest System, it is useful to review the enabling legislation that gave the Forest Service its early congressional mandate. It is instructive to begin with the Creative Act of 1891, which empowers the president to " . . . set apart or reserve . . . lands bearing forests or in part covered with timber or undergrowth, whether of commercial value or not, as public reservations . . . " And the Organic Act of 1897 states, " . . . No national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a contin-

uous supply of timber." Similarly, the justification for the establishment of the eastern National Forests in the Ozarks and the Appalachian mountains was grounded firmly on matters relating to water.

The language of these laws seems to imply an indifference to the wood-producing capabilities of National Forest lands. I mention this in order to flag the fact that National Forest lands may be, to a greater or lesser degree, not of commercially productive quality.

The references to water may seem curious, and in part they are. There seemed to be a firm belief within the fraternity of geographers (at least that branch that gave rise to the fields of climatology and meteorology) that weather and climate were influenced, or conditioned, by vegetation on the

"I think an objective view . . . would concede that greatly improved husbandry was called for."

land, including forests. This was conservation doctrine from which the economists of the day were not entirely immune. It may surprise some of you to learn that the fledgling American Economic Association, founded in 1885, held a joint session with the natural science contingent of the conservation community, with Gifford Pinchot, among others of that time, giving papers at the 1890 meeting of the A.E.A. in Washington.

But probably more significant in defining the responsibilities of the Forest Service than weather and climate modification was the political pressure exerted by officials of cities, principally cities in the Southwest (Gates, 1956). These officials were concerned about soil erosion from abused grazing lands silting up municipal water supply reservoirs. I think an objective view of the treatment of public lands at that time would concede that greatly improved husbandry was called for. The institution that emerged was a multiple-objective land management agency. From its inception, then, the Forest Service had a multiple-use management mandate.

This multiple-use mandate was further enlarged and extended *de facto*, if not by law. The Forest Service has not been permitted by law to charge

simply for admission to the National Forests. From its beginning to today, resources of the National Forests have serviced, without charge, hunting and gathering activities, although in earlier times they were perhaps more of a subsistence than a recreational nature. Indeed, out of this practice evolved, particularly in the postwar era, a tradition in the management of National Forests to provide recreational resources serving a multitude of outdoor recreation enthusiasts of every variety. Bob Marshall, Arthur Carhart, and others have received well-earned recognition for perceiving the importance of the national wilderness system in the American frontier ethos. But Marion Clawson deserves perhaps equal recognition for his foresightedness and his effective promotion of a national awareness that outdoor recreation in America was a significant and growing phenomenon that required effective public attention. To appreciate Clawson's influence, we need only to remind ourselves of the Outdoor Recreation Resources Review Commission and its chairman, Laurance Rockefeller, who was at the time a member of the board of directors of Resources for the Future. We remember also Clawson's classic

"This national awareness . . . contributed to the passage of the Multiple Use-Sustained Yield Act of 1960, establishing by law what was occurring *de facto* in the management of the National Forests."

article, "The Crisis in Outdoor Recreation" (1959) and his persistent work in securing public land, water, and related resources for outdoor-recreation purposes. If Carhart and Marshall are remembered for their effective efforts on behalf of wilderness, then Clawson should be acknowledged for his efforts on behalf of recreation on the more developed (roaded) portions of the National Forests, and other federal and state lands. His was a powerful voice on behalf of multiple-use forestland management.

This national awareness of the importance of outdoor recreational resource services contribut-

ed to the passage of the Multiple Use-Sustained Yield Act of 1960, establishing by law what was occurring *de facto* in the management of the National Forests. In this act, Congress established a policy that National Forests be managed for outdoor recreation, range, timber, watersheds, and wildlife; and with the passage of the Wilderness Act of 1964, for wilderness purposes as well. One might wonder about all the emphasis I have given water and recreation. There are two reasons. First, it is important to realize that the National Forests, except those in the Pacific Slope region and perhaps in the Southeast (Bowes and Krutilla, in press), do not occupy particularly productive timberlands. On most of these forests the value of the recreation resources may be as much as, or more than, the value of the timber resources. And in the Southwest, the watershed value of National Forests greatly exceeds their present timber value (Bowes and Krutilla, 1984). In a study of the subalpine forests of the central Rockies, we found the present value of water to be between \$240 and \$370 per acre, while timber was valued at only \$20 to \$35.

The second point is that valuable forestland services can be made available through management for multiple resources. I appreciate that any student of land management will mumble, "so what's new?" And were I targeting the professional land managers for these observations, I would concede the point. But instead, I am addressing these remarks to the informed public

"... this model, which represents the unwitting mindset that supports some forest economic policy studies... is not only largely irrelevant, but conducive to a great deal of mischief."

with special reference to economists who analyze policy. The reason is that members of the economics profession, from its Association's beginning in 1885 to the present, have not taken appropriate or effective note of the significance of the congressional multiple-use management mandate

in their studies and recommendations.

The most elegant treatment of the staple of forest economics, the economics of single-stand management, was presented by Paul Samuelson at the Forest Economics Symposium at the University of Washington only a dozen years ago (Samuelson, 1976). Beneath the polish of Nobel laureate Samuelson's paper we find the economic model first presented in 1849 by the German forester Martin Faustmann (Faustmann, 1849), the progenitor of modern forest economics. Faustmann was the first to provide a correct solution to the harvest scheduling problem. Samuelson, of course, didn't imply that his paper was original, or that it was in some sense an essential theoretical advance over Faustmann's original contribution. Indeed, he even disavowed that it was relevant for multiple-use forestland management. Essentially what Samuelson did was to provide a very elegant modern restatement of Faustmann's model and to demonstrate that it was consistent with the neoclassical theory of efficient resource allocation. I will be asserting that this model, which represents the unwitting mindset that supports some forest economic policy studies of National Forest management, is not only largely irrelevant, but conducive to a great deal of mischief. I want to make it clear early on that the Faustmann model has served well the purposes for which it was intended. As a single-stand, single-purpose management model, it is relevant and useful for private forest plantation management. Whether consciously or otherwise, it underlies the economic reasoning of successful private industrial timberland operations. But we have to understand that the Faustmann/Samuelson model is strictly applicable only to single-use timber management. There is a fundamental difference between the kind of analytical apparatus required for economic analysis of single-use and multiple-use forestland management.

Why is the Faustmann/Samuelson model inappropriate for management of multiple-use forestlands? Well, it seems that a multiplicity of different-aged stands, among other factors, is required to create part of the biological diversity needed to provide a variety of forestland resource services (Boyce, 1977). We need some openings to foster browse production, and some residual stands to provide cover for wildlife. In deciduous forests, we need a mix of age classes to provide hard and soft mast for different

species of wildlife. And as the trees in the forest grow, we find areas of browse production growing into older stands so that new openings must be created for forage production. Not only do we require a distribution of age classes among the stands on many sites, but we must also recognize that the stands or sites in a forest are inherently interdependent in their role of producing many forest resources and services. The relation between cleared patches and residual stands re-

"The single-stand model is basically a timber-management model, not a multiple-use forestland management model."

quired to manage snow for augmentation of water yield in subalpine Colorado forests, for example, is so well-established that it is possible to specify the optimal size of opening as a function of the height of the residual stands (Troendle and Leaf, 1981). And perhaps in the most commonplace of examples, the value of a developed campsite depends on the treatment of neighboring sites. These site interdependencies must be taken into account to determine an optimal long-term harvest strategy.

Another obvious reason why the Faustmann/Samuelson model is not appropriate for analyzing the multiple-objective management problem is that it addresses only private goods and services, leaving out of account the type of resource or service that economists refer to as public goods. The single-stand model is basically a timber-management model, not a multiple-use forestland management model.

Briefly, then, a proper analysis of the allocation of forest and budgetary resources requires an analytical model that incorporates a diversity of sites and their interdependence. A formal model that presents such an analytical apparatus has been developed by Michael Bowes of Resources for the Future (Bowes and Krutilla, 1985). Most of what I have to say in what follows draws directly from his work.

II

Now, does a multiple-stand, site-interactive model make all that much difference for the purposes of policy analysis? I think it does, because some otherwise quite competent analysts have reasoned to incorrect policy conclusions based on a Faustmann model mindset.

Perhaps the most celebrated analysis of Forest Service management (Clawson, 1976) was, as have been all such analyses, the product of a single-stand mindset. We read in Clawson's paper that the allocation of the National Forest system budget among regions and forests on a basis other than their shares of cash receipts is a measure of the mismanagement of the National Forests. Approached from a multiple-stand, site-interactive perspective, the analysis would have taken into account the budget required to produce forest resource services for which there are no charges, and other resource services for the public good. Or to state the case differently, over 90 percent of cash receipts of the Forest Service for the years Clawson analyzed came from timber revenues (more if purchaser road credits were counted). Most came from the Pacific Slope forests. A recommendation to budget forests in proportion to their timber revenues is surely an inappropriate prescription for economically efficient multiple-use forestland management.

I could refer with equal ease to some of my own work that relies for its theoretical underpinning on the equivalent of a single-stand Faustmann

"... forest recreation on prime timber-growing sites ... depends in part on special forest environments that are as good for spawning salmon ... as they are for growing timber."

model (Hyde and Krutilla, 1979; Krutilla and Brubaker, 1977). However, both because it is not nearly as celebrated, and because it is personally more embarrassing, I won't dwell on the deficiencies of my own work. But the fact remains that we economists casually rely on neoclassical resource allocation theory in our work, rarely if ever asking whether the conditions that must hold

for its validity do so in the world of reality.

Let me now discuss another prominent study (Nelson, 1982) that arrives at too-simplistic conclusions. While it does not overlook the importance of outdoor recreation on the National Forests, it ignores the interdependence of sites in joint production of forest-related commodities and services. Robert Nelson, of the U.S. Department of The Interior Policy Analysis Staff, recommends that public timberlands be separated from the public recreation lands, divesting the former to the private sector and retaining the latter in public ownership. The rationale for this prescription is, as Nelson puts it, that, "by concentrating on what each type of land does best, the total output value of recreation and commodity production would be increased."

What is overlooked in policy-analysis perspectives of this sort is that forest recreation on prime timber-growing sites, such as the forests of the Pacific Slope, depends in part on special forest environments that are as good for spawning salmon and steelhead as they are for growing timber. Even in California (Region 5), which contains a significant share of the Pacific Slope forests,

"... the policy prescription . . . may be likened to arguing for a separation of bees and orchards so that each can concentrate on doing what it does best."

the value of the annual forest recreation services (\$300 million) exceeds by a sizable margin the annual value of timber harvested (\$100 million). It is difficult to classify which land is timberland and which is recreational forestland, even though the policy prescription implies that they are mutually exclusive.

Timber and forest recreation lands below timberline are most often coextensive. Streambanks and riparian zones hold attractive campsites, quality sites for growing trees, and important habitats for fish and wildlife. In many cases, multiple-use production takes advantage of the interaction between sites when the objectives are pursued in coordinated fashion (Bowes and Krutilla, in press, Chapter 6). For example, it is possible to

enjoy a pleasant forest environment within a timber-harvesting area. Careful location of campsites and careful timing of harvests can accommodate both recreation and timber-management objectives. Thus, both forest goals can be achieved from the same area of the forest if their sites are not in close proximity in time and space (Bowes and Krutilla, in press, Chapter 7). In light of these interactions, the policy prescription to convert National Forests into single-purpose organizations (Nelson, 1982) may be likened to arguing for a separation of orchards and bees so that each can concentrate on doing what it does best.

One useful practical result of using the multiple interdependent stand approach in policy analysis is that it protects against errors that can stem from using the wrong analytical framework. In an important current example, the single-stand formulation leads inevitably to the conclusion that any stand whose timber proceeds do not cover costs of preharvest management, sales preparation, and harvest administration, is uneconomic (GAO, 1984). Viewed from the perspective of a multiple interdependent stand/multiple-use model, this conclusion is not necessarily so (Bowes and Krutilla, 1985). Even recently-harvested stands may enhance the value of resource services from complementary adjacent sites. The importance of such site interdependencies in providing amenity and aesthetic values is emphasized by the powerful opposition from recreationists to large clearcuts, extensive roading, and harvesting of timber. Because of these important resource interactions among sites, the effect of harvest on recreational and other values must be reckoned along with the value of timber harvested from National Forest lands. To put it another way, we cannot assert that the value of all services of a site does not cover the management costs even if the value of timber alone does not.

However, it must also be emphasized that not every below-cost sale is necessarily economic simply because it may be part of a multiple-use management regime. We cannot be certain that all the conclusions of a particular study are incorrect when the single-stand mindset is used. These are matters that can't be resolved by formal argument. However, the issue is open to resolution in any particular case by empirical analysis using an appropriate theoretical model (Bowes and Krutilla, in press, Chapter 10).

III

It may be useful here to summarize more concisely some of the differences we may expect from analyses using the conventional model and contrast them with those using Bowes' multiple interdependent site model. First, it is important to recognize that multiple stands can be managed for a single; i.e., timber, use. However, economically efficient multiple-use management cannot be effectively achieved without considering multiple stands and appropriate distribution of age classes and other attributes of a biologically diverse forest. The findings summarized below are produced from a dynamic optimization multiple-stand model (Bowes and Krutilla, 1983; Bowes and Krutilla, 1985). They contrast the results from management for timber alone with results from the model's application to management for multiple objectives. In both cases the same set of sites in the same initial conditions were studied. While the results are specific to particular applications of the model, they suggest the potential richness in multiple-use management that has not been made apparent in previous analytical treatments of the economics of forest management. In these exercises we discovered several things. At sufficiently low timber prices, timber management was found to be uneconomic. More precisely, under single-use timber management we found that all initially stocked sites were immediately harvested and then abandoned with no artificial regeneration and with no further timber management. Under multiple-use management there was a greater likelihood of regeneration and continuing harvest. The amenity value of standing timber and the age diversity among stands encouraged the continuing management of the timber resource. Even at very low timber prices, some level of harvest was desirable, because harvesting represented an effective means of manipulating vegetation for improved wildlife habitat and other amenity values. In general, on public forest lands, timber sales below cost and timber management can often be justified economically on the basis of the long-term improvement in multiple-use value that may result from harvesting.

At high timber prices we found, as might be expected, that the full multiple-use solution corresponds quite closely to the timber management solution. However, even with the high timber values, we often found some subtle effects on the

harvest schedule that resulted from considering the full mix of multiple-use values. If we begin with a forest area of fairly uniform stand age, then it can prove advantageous, particu-

"Harvest schedules, especially in the initial few decades of a multiple-use management regime, can be very complex."

larly in the initial decades, to delay some harvesting or to delay the regeneration of a stand in order to introduce a more diverse age distribution. These means of introducing diversity in the age mix of stands imposes little financial cost and can improve the flow of amenity values significantly.

In general there is no easy description of the effect that consideration of multiple-use values will have on the scheduling of timber harvests. Analytical work that is based on the study of single stands has led many to conclude that multiple-use values will best be met by the implementation of longer rotation periods than would typically be desired under management for timber alone. At least this is suggested to be true when older stands are generally preferred for their amenity value. In contrast, in our multiple interdependent stand examples, the benefit of maintaining some balance in the mix of age classes makes the optimal harvest timing very dependent on the initial condition (i.e., the specific age classes in the set of stands) of the forest. Harvest schedules, especially in the initial few decades of a multiple-use management regime, can be very complex. Younger stands might be indicated for harvesting while older stands are left unharvested. It is also the case that a higher relative recreational value does not necessarily lead to a longer rotation even though older stands are generally preferred for their amenity values. Instead we might see an increasing amount of the area set aside as protected old-growth while a shorter timber rotation is instituted on the remaining sites in the management unit. We find such solutions even when the management area is perfectly homogeneous. Such harvest solutions could not be found if the stands were treated independently.

We find that the benefits from diversity of standing stock may lead to the allocation of areas of the forest in a manner that looks like specialization of functions by land areas; for example, a decision to preserve some stable stands of old-growth indefinitely while harvesting other adjacent stands on short timber rotation. However, it is important to note that this specialization has resulted from the application of the multiple-use model. It does not correspond to the solution that might result if specific stands were initially allocated to serve specific functions. It seems quite likely that specialization of land use, such as we find, is often likely to result in more effective production of such services as wildlife and increased waterflow than would be possible from uniform management of a land area. One interesting related result of multiple-use management is the potential advantage from the varied specialization of use over time, rather than over location. We find that multiple-use values are sometimes best provided by periodic high levels of timber harvest with intermediate periods of little or no harvest. Such a noneven harvest flow policy could be indicated for areas where high levels of harvest promote wildlife values, while low levels of harvest have little beneficial effect. They might also be indicated in areas where amenity values are greatly degraded by even the lowest levels of harvesting activity. In such areas we might choose to have periods of heavy harvesting followed some years later with periods of high amenity values. All these complex harvest solutions described above contrast strongly with the simplistic harvest schedules that will result from single- or independent-stand models.

The differences I have described in timber management under economically efficient multiple-use management of interdependent sites, as contrasted with a single-stand timber solution, can be expected to result from the various multiple-use values that depend on the diversity of the forest condition. With sufficiently high values attached to the nontimber resources, the improvement of the age mix or other attributes of the forest condition may determine completely the timing of the harvest (Bows and Krutilla, in press, Chapter 5).

The complexity of the harvest solution is due to the nonlinearity of the nontimber benefits across the individual sites. Such nonlinearity seems generally to be expected.

IV

Moving from policy-analysis studies to forest-level planning and management studies, a multiple-stand, site-interactive model indeed has been used in the current round of forest planning. This is a large linear programming model referred to as FORPLAN, which is structured to address selected problems in forest planning. Given the great amount of frustration encountered by the first round of planning using FORPLAN, a question very frequently asked is, "Is FORPLAN the right analytical approach to the problem?" Many with experience in the field will respond in the negative. But not everyone agrees with so pessimistic a view. We need to appreciate that many of the problems

"... there has been substantial ignorance concerning the precise biophysical responses to changes in management activities."

with applying FORPLAN resulted from the first introduction of field-level analysts to the model and the fact that many of the data required for satisfactory analysis were nonexistent. The results, while not universally celebrated, were nonetheless to be expected. I want to comment on both the data issue and the structure of the FORPLAN model.

Ordinarily the information required in forest planning is the change in value of a forest resource or resource service in response to a change in level of management. This kind of information is often very difficult to obtain, and so there has been substantial ignorance concerning the precise biophysical responses to changes in management activities. In the relationship between wildlife habitats and population numbers, the role of vegetation management is just becoming sufficiently well-understood (Boyce, 1977; Salwasser, Siderits, and Holbrook, 1984; Thomas, 1979) to make possible quantitative estimates of wildlife responses to habitat changes (Holthausen and Dobbs, 1985). Similar models for silviculture and hydrology are being developed to obtain better planning-level estimates of the biological and physical changes occurring in response

to different management regimes. This is not to suggest that by now all the biological and physical relationships are well enough understood to permit their modeling with sufficient precision to obtain exact predictions. It does seem, however, that the enormous effort invested by the Forest Service in the past round of forest planning will provide much better information with which to address future forest planning efforts. Doubtless there will be those who will always find the glass half empty in this regard, but there is increasing assurance that it will be at least half full.

When we consider the task of economically evaluating the biophysical results from changes in management, we have another large area for improvement. Without proper information, it is very difficult to judge the economics of alternative management regimes. With improvement in estimating the effects of different management regimes on the forest's biophysical systems, however, the economic evaluation can be expected to improve. And when we can observe and evaluate human responses to improvement in wildlife habitat, as Dr. Wilman's work has shown (Wilman, 1984; Bowes and Krutilla, in press), it may in some cases be possible to go directly to evaluation of the management activity without first obtaining the biological response to improved forage. That

"The current round of forest planning, however, has cost more than anyone had initially expected."

is, the response of recreational hunters will provide the data from which to infer directly the increase in value of the sites in response to management activities.

Proceeding next to the issue of FORPLAN as a usable model, Bowes feels that: 1) modification of the model's structure is needed to better address the locationally specific features that need to be considered, and 2) increased attention to the early years in the planning process, with much less detailed attention to the off decades, could achieve substantial improvement by identifying a variety of choices. Such improvements are likely to be achievable without proportionate increases in cost. The current round of forest planning, how-

ever, has cost more than anyone had initially expected. Accordingly, the question of improved analyses needs to be considered in light of the question whether improved planning would necessarily mean improved management. This, of course, cannot be taken for granted. A major reason for our doubt is that the budget and appropriations process appears to move along a separate track from that of forest management. We may take a moment to consider why this is the case.

When the annual budget proposals are prepared at the forest level, we would like to believe that the most defensible projects or program components are advanced. These are presented to the regional office in the form of Management Information Handbook codes, often referred to as MIH codes. At the regional level they are collected into a lesser number of Program Development and Budget codes (PD&B codes). When the budget proposals developed at the field units arrive in Washington, the budgetary data are converted to yet another set of codes. These are the line item codes required of the Washington Office in dealing with Department of Agriculture and, subsequently, with the Office of Management and Budget (OMB) and the relevant Congressional Appropriations Subcommittee. They are referred to as the Appropriations and Function codes. While the field unit codes are related to activities (kinds of work) that are performed at the field level--projects or program components--the Appropriations and Function codes are related to budget line items. The problem is that appropriation by line item is insensitive to the relationships between program components represented by different budget lines. These differing sets of codes make the conversion of budget data from the MIH base at the forest level to the Appropriations and Function base at the Washington level, and then back down again, something less than a crisply satisfactory exercise. Not only is there a problem in translating codes among conceptually different bases, but also there is an additional problem of preserving identity of the projects presented by the forests in their budget proposals.

Thus it has been, and will continue to be, largely coincidental if the production targets and budgets that come down to the field level from Appropriations and Functions line items bear any close resemblance to the set of program components developed at the forest level by the forest

plans. This is worth repeating. The individual forest's production targets, personnel complement, and funding ceilings derived from the budget and appropriations process are usually inconsistent with the forest-level plans and proposals, and sometimes even with feasible production possibilities. I know this sounds preposterous. It is. But independently of my own discovery there is ample corroboration in the appendix to the April 4, 1986 letter from Frederick D. Wolf, director of the General Accounting Office to Sidney R. Yates, Appropriations Subcommittee Chairman:

Forest Service field personnel advised the subcommittee staff that management decisions are based primarily on attaining the yearly timber volume goals and that their success as managers is based on meeting these targets, not on any type of assessment involving a cost-benefit comparison (Appendix I, p. 7).

A Forest Service task force report entitled, "Analysis of Cost and Revenues in the Timber Program of Four National Forests," echoes the observation that employee incentives tend to lead away from, rather than toward, economically-oriented management behavior.

Finally, at the field level, using the computerized communications network, we find a discussion (message 566 on 12/17/85) that addresses the "lack of correlation between the budget allocation and the budget proposals." Further in the message there is reference to the problem "between budget allocation and the implementation schedule for the Forest Plan.

It thus seems clear that after enacting the Renewable Resources Planning Act and the National Forest Management Act, the Congress provides the means to implement its legislative handiwork in a way that will only preclude its success. Unless there is a thoroughgoing budgetary reform that will encourage the budget and appropriations processes to move in concert with the planning and management efforts, there will continue to be two very different and inconsistent National Forest management tracks. And this is bound to exacerbate the many frictions and conflicts that are already endemic in a resource allocation and management system that must rely as much on public participation decisions as it does on market prices to motivate its resource-management decisions.

V

During the course of this evening's odyssey we have considered the nature of the National Forest System, seen as the result of evolving legislation that did not in most instances result in reserving lands that were principally quality timber-producing forestlands. We have talked a bit about some mistaken impressions that one is likely to obtain about the efficiency of National Forest management by evaluating the Forest Service's performance using a single-stand resource allocation theory. We have noted that this is certainly not in accord with the basic legislation establishing the forests as multiple-use forestland reserves. I have suggested that a more realistic theory of efficient resource allocation was required and that to that end Michael Bowes has bent his best efforts. During a long gestation period he has worked to bring the theory up to date and to make it directly relevant to the economics of multiple-use management of public forestlands. I think that with its aid we can see for the first time that an economic allocation theory can provide an underpinning for many practices that have been intuitively sensible, even though they were at variance with forest planning economics as seen through the prism of a single-use timber model theory.

I have suggested that forest planning under the NFMA has progressed in the spirit of multiple-use management, taking into account site interactions. It is only natural that wildlife biologists and ecologists would pay special attention to these considerations, because these interdependencies are very much a part of their education and practice. However, the forest plans have not turned out to be as useful as they can be made to be for the next rounds of forest planning. We can expect both better information on the biophysical responses to various management strategies and better economic evaluation capability to be developed before the next round of planning.

I have raised the question of whether this arduous planning exercise is warranted before something is done to bring the management planning and the budget appropriations tracks into alignment. This task is, in my judgment, the single most important task that can engage the attention of those with an interest in improving multiple-use forestland management. Without getting the budget and appropriations process to function in concert with a multiple-use management program, no amount

of effort on improved planning and management can compensate for the deadly effect of their present incompatibility on efficient public land management.

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THE SHIFTING POLITICAL ENVIRONMENT

by

Jerry Miles

INTRODUCTION

Once upon a time, not so many years ago, it would have been almost unthinkable for a student of political science or a public administrator to be invited by a college of forestry to speak at a distinguished lecture series like this. It was difficult, in those days, to see any connection between trees and politics. But today, as the old song goes, the times they are a'changing.

Trees have become almost as important to politicians as they are to foresters. Decisions regarding the business of forestry are now often made with one eye cocked toward Washington or the state capital and the other toward the marketplace. Even after deregulation and tax reform, the modern forester is as concerned about decisions made by legislatures as those made by boards of directors.

The number of professional societies, business and industry groups, and citizens' associations with representatives in our national or state capital is testimony to the impact that political decisions have, not only on forestry, but on a very broad spectrum of different interests. In fact, the power of such groups has grown to the point where Dr. David Brown of George Washington University convened a workshop at the 46th National Conference of the American Society for Public Administration on the subject, "The New Challenge to Public Administration: Working with Associations." As Deputy Chief of the Forest Service, an agency that maintains contact with 148 separate public and professional groups outside government, I was invited to be one of the participants on the panel. Such groups, although they include only a small percentage of those with representatives in Washington, reflect a variety of different and often conflicting points of view.

"Decisions . . . are now often made with one eye cocked toward Washington . . . and the other toward the marketplace."

Jerry Miles has served in several federal administrative posts during his long public-service career, including those of Chief Budget Officer for the Department of Agriculture and Comptroller for the Department of Energy. Most recently he was Deputy Chief for Administration of the USDA Forest Service until his retirement in 1986.

CHANGES IN THE WAY OUR GOVERNMENT WORKS

For most of the past 33 years I worked as a part of the top career management team in three separate federal departments, and was an observer of and participant in the government's decision-making process. Further, during the early years of my career, I was trained and supervised by those who had come to Washington earlier as part of a huge wave of federal employees to administer

the programs of the New Deal. As a practitioner of the theories of political science and public administration which I had been exposed to in college, I often found myself trying to relate the interactions that were going on around me to my earlier understanding of the way the government was supposed to operate. There were significant differences. It is the purpose of this presentation to examine with you the changes that seem to be occurring and where these changes seem to be leading us.

I believe that during the past 50 years important changes have taken place, not only in the number and complexity of the laws which directly affect us, but also in the way our government operates and the way the public has to deal with the federal government. I would also claim, but from a much more limited perspective, that these changes are almost identical to changes that have occurred at the state and local levels as well. Those I believe to be the most significant are:

- the growth in the power of the judiciary,
- the decline in the power and influence of the legislature, and with it, the power of the political "establishment," and
- the increase in the size and strength of the bureaucracy.

"We live in a litigious society, probably because we as Americans seem to have an inborn need to see that justice is done."

When we consider that every member of Congress is elected by the people, but that the President and Vice President are the only elected members of the executive branch and that no one in the federal judiciary is elected, we can begin to understand the enormous impact which such a shift in power has had in terms of the responsiveness of our government to the people.

GROWTH OF JUDICIAL POWER

The Political Nature of the Judiciary

We live in a litigious society, probably because we as Americans seem to have an inborn need to see that justice is done; i.e., justice as we see it. We also seem to have an unusual respect for our judicial system, unusual in view of our apparent loss of respect for most other institutions. We are trained in the notion that the judiciary is free from the stain of politics, and consequently worthy of our trust. We sometimes forget that many appointed to the bench lived and fought in the political world before coming to the court, and that many are appointed to the bench by presidents and governors in order to eliminate them as possible opponents in future elections.

The political nature of the judiciary is not lost on those who seek to influence the actions of the government through litigation. Judges who have demonstrated a particular point of view with regard to a given subject act as magnets for those who share that point of view and seek change

"... many suits involving environmental issues became landmark cases ..."

through court action. Further, more and more, new appointees are being scrutinized as to their philosophical and political orientation. I believe it would be fair to list the U.S. District Courts in Oregon and Minnesota and the recent Justice Rehnquist nomination hearings as examples of these conditions.

The field of natural resources has become a major battleground where disputes increasingly have been sent to the courts for resolution. Michael Frome (1984) states, "Between July 1, 1964, and June 30, 1974, a total of 74 lawsuits was filed against the Forest Service." The issues covered nearly every aspect of the agency's work. Although most of the litigants were ultimately unsuccessful in court, they were able to significantly delay many projects and focus public opinion on issues which heretofore had not been considered, by government officials at least, as controversial.

On the other hand, many suits involving environmental issues became landmark cases profoundly affecting the way government carries out its business, and profoundly influencing future legislation. The Monongahela decision led to the Forest Service planning processes prescribed in the National Forest Management Act of 1976. The decision in the case of *Sierra Club v. Block* regarding RARE II established the pattern for release language included in subsequent wilderness legislation. Interestingly, we are now experiencing a curious cycle where vague laws are challenged in the courts, whereupon the court's interpretation is modified by subsequent legislative action which then becomes subject to further judicial interpretation.

Actions of the Courts to Increase Their Own Power

We have also seen, especially in the past fifty years or so, a tendency on the part of the courts to expand their own jurisdiction. By interpreting the Constitution as a living document, changing as our society changes, the courts are able to revise its meaning without going through the tiresome and time-consuming procedure of amendment and, for that matter, without involving the American people in considering whether they agree or disagree with such changes. I heartily agree with what Adolf Berle said in the Carpentier Lectures at Columbia University in March 1967: "Ultimate legislative power in the United States has come to rest in the Supreme Court of the United States." How different this notion is from Alexander Hamilton's views of the judiciary when he wrote in the *Federalist Papers*:

Whoever attentively considers the different departments of power must perceive that, in a government in which they are separated from each other, the judiciary, from the nature of its functions, will always be the least dangerous to the political rights of the Constitution; because it will be least in a capacity to annoy or injure them . . . (T)he judiciary is beyond comparison the weakest of the three departments of power.

DECLINE OF THE LEGISLATURE

The Budget Crises

Along with the growth in the power of the courts, or perhaps as one of the causes of it, has come an apparent decline in the power of the legislature. Controlling the growth of the budget, a responsibility clearly assigned to the legislature by the Constitution at the federal level at least, is an excellent example of the inability or unwillingness of the Congress to deal with a highly controversial issue, despite the efforts of several different administrations of both political parties.

It took the federal government from the beginning of the Republic to 1931 to spend its first \$100 billion. And although spending increased rapidly during the early days of the New Deal and during World War II, it did not reach the \$100 billion annual level until 1962. Now, less than 25 years later and with a conservative president and Senate, it will soon reach the trillion-dollar mark. Although these numbers are not in constant dollars and consequently somewhat overstate the problem, almost everyone agrees that federal spending is out of control and has been for several years. Furthermore, this is a continuing concern. In the early sixties, every effort was made to keep the annual budget below the \$100 billion mark. It was widely believed that the public would not stand for excesses beyond that level. But once that figure was exceeded, the public furor abated and the numbers continued to soar.

Planning, Programming, and Budgeting

President Johnson sought to find enough money for both the guns of the Vietnam War and the butter needed to feed the Great Society by instituting Secretary of Defense Robert McNamara's planning, programming, and budgeting system (PPBS), which had been used, allegedly with some success, by the Department of Defense. Through this system the economic costs and benefits of every federal program were to be measured, and presumably the winners would go forward and the losers would fall by the wayside. Though in concept it was a meritorious effort, somewhere along the road it failed. It was unsuccessful, in my judgment, partly because it often neglected benefits that were difficult or even impossible to measure from an economic point of view, and partly

because politicians are not often persuaded by economic arguments. The economic argument that persuades most politicians is whether more money flows to their constituents out of the state or national treasury than flows from them in the form of taxes.

Research budgets are outstanding examples of the allocation of funds by congressional district

"The economic argument that persuades most politicians is whether more money flows . . . to their constituents than flows from them in the form of taxes."

rather than by research priorities. When I was the budget officer for the Department of Agriculture I once visited the Corvallis Forest Research Laboratory with representatives of the Forest Service because of the preferential treatment this lab seemed to receive over other Forest Service facilities. I'm sure that it was not a coincidence that Julia Butler Hansen of Washington was chairman of the subcommittee responsible for the budget of the Forest Service, and Wendell Wyatt of Oregon was ranking minority member.

Efforts by the Nixon Administration to Control Spending

The Nixon Administration offered a different solution in the form of other processes. First, the administration sought to put a statutory cap on federal spending. When, in the waning days of the ninety-second Congress the effort, after succeeding earlier, ended in failure, the President waited until after the election. Then, in what would have been a tremendous expansion of presidential power, he impounded funds for programs he had sought to eliminate or reduce. The courts quickly responded by ruling in many separate cases that the President had exceeded his constitutional authority, and they reversed his decisions.

The Congress then passed the Congressional Budget and Impoundment Control Act to reestablish its power over the federal purse. Ironically, one of the primary features of the new act, born out of the desire to control federal spending, was that

it now required the executive branch to spend all money appropriated to it unless it received congressional approval to defer or rescind spending authority, approval which has been almost impossible to get. Consequently, the unwillingness of the legislative branch to deal with the budget led to an even more chaotic situation.

The President then tried a different approach. With a heavy influx of people from the business world, the administration offered management by objectives as the system for stemming the growth of government and spending. Conceptually it was a sound system. It required the bureaucracy to define precisely the goals and objectives of each program and subsequently to evaluate the success of the program in meeting these goals and objectives. Again, the system failed for most of the same reasons that PPB failed in that it ignored political realities, especially the unwillingness of the Congress to deal with the budget on something other than a political basis.

Presidents Carter and Reagan Try Again

When the administration changed again, President Carter brought a new system with him that he undoubtedly believed would succeed where the others had failed: zero-based budgeting (ZBB). This system required the bureaucracy to evaluate every one of the thousands of federal programs each year from the bottom up and rank them in priority order. Those at the bottom of the heap would presumably be cast aside when federal spending reached some upper limit. Unfortunately, his system did not put the brakes on federal spending principally because the Congress continued to find it impossible to say no to an army of petitioners. Carter's administration was replaced after a single turn at bat.

We are now faced with another magic system which is supposed to succeed where others have failed: Gramm-Rudman-Hollings. When federal spending reaches a specified upper limit, across-the-board cuts are made to all, or I should say, almost all programs. In this system all government programs are presumed to be of equal merit and consequently the budget axe falls upon the just and unjust alike. However, clever legislators have learned that some programs can be exempted and others can have their budgets inflated in the appropriations process so that the mandatory reductions bring them down only to the level which

the committees felt was appropriate anyway.

The budgets of the Forest Service and the Interior Department fall within the category of

"... it is difficult to imagine that the management of our public lands and resources is somehow 'discretionary.'"

"discretionary" spending. This leaves them relatively unprotected from across-the-board cuts such as those envisioned by Gramm-Rudman-Hollings. Consequently, they will always suffer disproportionate reductions when automatic budget systems are put into place, even though it is difficult to imagine that the management of our public lands and resources is somehow "discretionary."

"... we have noted many non-partisan political groups that have gained tremendous influence over the past several years."

Changes in Political Organizations

Why is it so difficult for the Congress to deal with an issue like the budget when it appears that nearly everyone agrees that something needs to be done? There are literally dozens of answers that come to mind. However, four factors, when joined together, become of paramount importance. These are:

- the decline in the number of people who purport to be a member of either political party,
- the relative closeness of most elections,
- the growth in single-issue public interest groups and their vigorous political activity, and

--changes in the Congress itself.

Obviously, as partly loyalty and discipline have broken down, so has the ability of party leaders to persuade their followers to accept every plank of the party's platform. Furthermore, where elections are close, a single-interest group can often develop a strong enough following to swing an election to a candidate who shares its point of view despite the candidate's political label. In the natural resource field, we have noted many non-partisan political groups that have gained tremendous influence over the past several years.

Growth in Non-Partisan Political Organizations

This change was noted by Paul Ellefson in his article on political action committees in the May 1986 issue of the *Journal of Forestry*. In his article he says:

One institution that gained notoriety during the heat of the 1984 electoral battles was the political action committee, or PAC. Growing from virtually none in the 1970s to well over 4,000 in 1985, PACs supplied an estimated \$113 million to the political machinery of 1983-84 congressional candidates

...
Why should forestry professionals be interested? We are responsible for understanding the world of electoral politics as it influences our lives as professionals and as citizens. Professionals need to know about PACs as institutions that are helping to shape legislative systems.

This increase in the establishment of organizations of like-minded people who believe they can significantly enhance their political leverage by joining together has had a major impact on politicians and political processes in recent years. The ability of such groups to attract enough money to either go to the courts to seek changes in laws and regulations they do not like, or to influence elections by contributing to candidates who share or can be persuaded to share their particular philosophy, has made them rivals to existing political parties. Further, they are not burdened, as parties are, with the task of laying out a compre-

hensive position covering all the issues which party members are interested in. They need only deal with their particular issue.

Congressional Representation

It was almost axiomatic in the past that senators and congressmen gravitated to committees that were most directly related to the economy of their area and the direct interest of their constituents. The Oregon delegation still fits that traditional pattern. Its senators serve on such committees as Appropriations, Finance, and Energy and Natural Resources, and its representatives on Appropriations, Agriculture, Interior and Insular Affairs, Budget, Energy and Commerce, and Small Business.

Today, however, senators and congressmen have a much broader choice. They may find that although their constituents are not tied economically to an industry like the forest industry, they are members of one or another of these political action organizations and are very interested in the way forests are managed. This can affect important committee assignments.

For example, John Siberling, the chairman of one of the key subcommittees of the Interior and Insular Affairs Committee of the House of Representatives, has a keen interest in issues relating to both native Americans and wilderness. Yet he

"Should lawmakers be concerned only with short-term, practical economic issues? Obviously, no."

represents an urban area in Ohio where he is not directly associated with either. Sidney Yates, the chairman of the Appropriations Subcommittee of the House responsible for the budgets of the Interior Department and the Forest Service, represents a district in the city of Chicago.

Both these distinguished gentlemen represent constituents who do not have any direct economic interest in the areas with which the congressmen are concerned. Thus they and others like them may be less concerned with the consequences of their decisions on jobs, income, and prices as they affect a particular geographic area. They may

instead give greater consideration to issues which appeal to their own constituencies with their concern for clean air and water, parks, and recreation.

What does this suggest? Should lawmakers be concerned only with short-term, practical economic issues? Obviously, no. It suggests that the interests of the nation are becoming more intertwined. The days when each congressman was able to stake out a small area of expertise where his or her judgment would generally be recognized by the entire Congress are gone. The timber industry in the Northwest, the environmentalists in the Northeast--every interest group in the nation--must be able to describe its requirements in terms that a majority of Americans can understand and support. They must be able to persuade congressional leaders that they share others' interest in preserving those areas of rare and exceptional beauty, but also recognize the need for timber production. They must actively support every reasonable effort to clean up our streams and our air and protect our wildlife. And they must be willing to compromise. In other words, they must understand that changes in laws and changes in the way our government operates will require changes in the way we deal with politics and politicians.

Planning and Analysis as Solutions

Another factor that may have contributed to the decline in the power of the Congress is the tendency, especially in recent years, to try to solve political problems through the institution of new and immensely complex planning and analytical processes. Several key pieces of environmental legislation set forth such broad and sweeping goals that their attainment through the legislative prescriptions provided is practically impossible. For example, let's examine some of the language of the National Environmental Policy Act of 1969 (NEPA). The purposes of the act are to

declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural re-

sources important to the Nation; and to establish a Council on Environmental Quality.

The Act goes on to state that

it is the continuing responsibility of the Federal Government to use all practical means . . . to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may--

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
- (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

All these results were to be achieved by utilizing "a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment."

Public Involvement

This reliance on planning and analysis as the means by which the problems of the universe could be cured and public consensus achieved seems to be an outgrowth of the PPB system. Two other ex-

cellent examples involve the land management responsibilities of the Forest Service. In 1974, the Forest and Rangeland Renewable Resources Planning Act became law. Under this Act, the Secretary of Agriculture prepares an assessment of the nation's forests and rangelands every ten years and a program for meeting the needs identified in the assessment, every five years. The program may include alternatives for "management and administration of the National Forest System, for research, for cooperative State and private Forest Service programs, and for conduct of other Forest Service activities in relation to the findings of the assessment." The second example, the National Forest Management Act of 1976, required that plans for each National Forest in the National Forest system be completed by September 30, 1985.

These planning efforts are to be carried out by Forest Service professional employees, but they are to involve adequate participation by the public. For example, the Acts provide that "The Secretary shall provide opportunity for public involvement and consult with other interested governmental departments and agencies" and, in the case of land management planning, that "The Secretary shall provide for public participation in the development, review, and revision of land management plans."

To what end are these planning responsibilities aimed? They obviously are intended to achieve better multiple-use management of our nation's forests and rangelands. And how is "multiple-use" management defined in law? Here is what the Multiple-Use Sustained Yield Act of 1960 says:

"Multiple use" means the management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people . . .

These are beautiful words and laudable goals, but they hardly represent crisp and clear instructions to that branch of the government which is supposed to limit its activities to the execution of laws passed by the Congress and signed by the President. They establish such grand goals that they are almost certain to fall short. Thus they open the agency to further legal action because of its inability to accomplish what the promoters of the legislation sought.

The September 1986 issue of the *Journal of Forestry* includes an article by Walstad and Dost regarding the banning of 2,4,5-T. The article gives us an excellent example of the political process overwhelming the study and analysis requirements of the National Environmental Policy Act. Despite the efforts of the bureaucracy to carry out the intent of the legislation, the final decision regarding the banning of this chemical was more a result of public perception than of scientific

"By replacing tightly-worded, prescriptive statutes with more generalized statements . . . the legislature has handed greater responsibility to the bureaucracy."

ic analysis.

The desire on the part of the political leaders to make the public participants in the management of public programs in undeniably good. However, the process is long and tedious, it is tremendously expensive, and it does not seem to lessen the possibility of subsequent court action, and with it further delays and still greater costs. And, unfortunately, it does not assure better decisions.

THE RISE OF THE BUREAUCRACY

By replacing tightly-worded, prescriptive statutes with more generalized statements of public purpose, the legislature has handed greater responsibility to the bureaucracy. Incidentally, it has also thereby contributed to the growth of the judiciary, since final interpretation has come to rest with the courts.

Max Myers, a former agricultural economics professor of mine at South Dakota State University, and later an administrator of the Foreign Agricultural Service of the Department of Agriculture, once told me that a good law had to have three requisites: it had to be politically acceptable, economically feasible, and administratively workable. He went on to say that most laws could meet two of these three requirements, but that it was extremely difficult for a law to meet all three.

Although he was talking about laws involving

agricultural policy, the same requisites can be applied to any legislation. The Congress has an admittedly awesome task, particularly as it attempts to deal with more and more complex and controversial issues.

How well has it done? Most legislation must meet the standard of political acceptability or it could not be passed by the legislature. Insofar as economic feasibility is concerned, the record is mixed, at best. As I once heard Don Paarlberg, former Assistant Secretary of the Department of Agriculture, say, "We need more one-armed economists who won't be able to say, 'but, on the other hand.'" Most legislative proposals that affect the economics of a given industry or the economy in general will have both supporters and detractors, both often equally well-respected in the academic community. One is left with the suspicion that the line between economics and politics is at best blurred and at worst nonexistent.

This brings us to the question of administrative

"We need more one-armed economists who won't be able to say, 'but, on the other hand.'"

workability. Rarely can or should the legislature be drawn into the administrative design of a program. This is properly the milieu of the bureaucrat. Yet the size of the bureaucracy is testimony to the ability of the human mind to conjure up inordinately complex administrative systems. An examination of the Resources Planning Act and land management processes of the Forest Service should provide ample evidence of overly complex planning processes.

There is, if not a justification, an explanation of this complexity. Bureaucrats, despite their career status, are not insulated from the political process any more than judges are. They report, within the executive branch, to political leaders, and must be responsive to them whether or not they agree with them. This is a fundamental requirement if our system of government is to work properly.

They are also required to testify before congressional committees charged with the oversight

of the laws to explain and justify their actions. If they are to be successful, they cannot be risk-takers. They must seek safe ground since they hope to survive a change in administration and serve a future administration of perhaps a different political party. Their refuge is in administrative rules and regulations. The power of the bureaucracy is directly related to the size and complexity of its programs and the vagueness of the statutes it is called upon to administer.

FUTURE TRENDS

Conditions Likely to Exist in the Future

It is not my purpose to judge whether the changes that are occurring are good or bad. For our purposes it is enough to recognize that they are taking place, so that in framing a course of action for the future we do not do so based on an outdated image of governmental institutions. They no longer behave as we once were taught that they did.

The future will almost certainly be marked by an aggressive judiciary and a timid legislature, a huge national debt, complex systems and regulations administered by a substantial bureaucracy, and well-informed, articulate, and well-financed public interest groups willing to challenge the decisions of their government whenever they believe these decisions do not represent the goals and ideals of their organizations.

What will this mean to us? How will we respond to it? The key word for the future is involvement. Those who stand by in the future and wring their hands and decry the vicissitudes of big government will be able to do little to either influence or control it. The days are waning when big business and big unions, with their massive treasuries and memberships, could largely dictate to political leaders their courses of action. Countless new organizations, often wedded to philosophical rather than economic principles, and appealing to a wide cross-section of an informed and interested public, will expand their influence.

If we do not like what is emerging, we cannot blame the President, the courts, the Congress, or the bureaucracy. We can blame only ourselves. For in a democracy, as trite as it sounds, ultimate responsibility rests with the people. If we do not like the kind of government we have, we must change it. The tools for change have been supplied

to us. We need only learn how to use them.

What should we do? Fortunately, Oregonians seem to be in pretty good shape. There is a long history of political independence in the state, a history of active involvement in public issues. However, even the most knowledgeable of us needs to continue to study the evolution of government, much as we need to stay current on new developments in science or management.

LEGISLATIVE RESPONSIBILITIES

We need to recognize that not every bill introduced in a legislature is expected to pass, even by the person who introduced it. Thousands of bills are introduced in each session of Congress with apparently no more serious purpose than to impress a gullible constituency with the introducer's sincerity. We must remember that there is a difference between the arts of politics and of government. Politics deals with getting elected whereas government deals with what one does after one is elected. It does not necessarily follow that those adept at the former are also good at the latter.

We need to learn more about those issues that affect us and that we attempt to influence. Further, we need to learn more about these issues, not second-hand from those who agree with us, but from those who honestly disagree with us. John Stuart Mill's views on the freedom of thought and discussion are as appropriate today as they were when he wrote them in 1859:

He who knows only his own side of the case, knows little of that. His reasons may be good, and no one may have been able to refute them. But if he is equally unable to refute the reasons on the opposite side; if he does not so much as know what they are, he has no ground for preferring either opinion . . . Nor is it enough that he should hear the arguments of adversaries from his own teachers, presented as they state them, and accompanied by what they offer as refutations. This is not the way to do justice to the arguments, or bring them into real contact with his own mind. He must be able to hear them from persons who actually believe them; who defend them in earnest, and do their very utmost for them. He must know them in their most plausible and persuasive form; he must feel the whole force of the diffi-

culty which the true view of the subject has to encounter and dispose of; else he will never really possess himself of the portion of the truth which meets and removes that difficulty.

Public Responsibility for the Judiciary

We cannot remain passive about a judicial system that seems to grow in power at the expense of other public institutions. We need to know more about the views of those members of the judiciary who are elected to office and more about the views of those who appoint judges, or advise and consent to their appointment, regarding the appropriate role of the judiciary.

Budget Reform

We should not continue to accept government deficits that threaten the financial stability of our nation now and for decades into the future. There is no magic solution to balancing the budget. Government spending must be cut, or taxes must be raised, or possibly both. Then we need the assurance of a constitutional amendment to prohibit such profligacy in the future. The propensity of politicians to seek favor by spending someone else's money can be curbed no other way.

In recent years the budget system has become the primary means by which policy differences are reconciled. This is not what it was intended to be. It was, and should become again, the financial plan for programs already authorized by law and to which political commitments have already been made. As long as laws stay on the books even though they fail to accomplish what they were intended for, or do so at a cost that the public cannot afford to pay, the temptation to fund them will always overwhelm some legislators.

Yet pleas simply to repeal certain legislation have largely fallen on deaf ears. We need to apply sunset provisions rigorously to most of our legislation. When laws are about to expire, we need a comprehensive reexamination of the continued need for them and whether that need, if in fact it still exists, can be met by less expensive and more effective means. This review should not be performed by those who administer such programs because they will almost certainly find reasons to continue the status quo, but rather by some institution with no direct interest in the results of the analysis.

Uses of Planning and Analysis Systems

We must not tolerate a bureaucracy indifferent to the needs and desires of the public it is supposed to serve. Nor can we continue to allow federal systems to flourish that cost far more than they are worth, and more than we can afford to spend. A good place to start is with the federal

"We cannot expect to reach consensus on every public issue, no matter how much data we gather or how many times we run it through a computer."

budget system. It needs to be streamlined and simplified to reduce its cost and the amount of time federal executives and legislators spend on it.

Other systems also need simplification. These include the RPA and land management processes of the Forest Service. We cannot expect to reach consensus on every public issue, no matter how much data we gather or how many times we run it through a computer. Study and planning are sometimes excuses for inaction. Delay seldom produces better results, just more expensive ones. If we are to improve the efficiency of our government, we should not do so by making more efficient that which we should not do at all.

We need planning and analysis and it must be professionally done. But, and I hope this is not a contradiction, we need to keep it simple and understandable so that it can be used by an often inexpert public in making up its mind on controversial issues. Professional analysts need to be able to communicate effectively if the results of their work are to have value.

Citizen Responsibilities

If this paper seems to be critical of the courts, the legislature, and the bureaucracy, I can only say that that is what was intended. But the solution to these problems should not be left to the courts, the legislature, and the bureaucracy. The solution to these problems should be left to us, the public, just as our founding fathers intended. All

of us have to learn more about our government and how it really works. We must learn more about the issues in which we have an interest, not from those who share our views, but from those who disagree and hold to their views as passionately as we hold to ours.

We must recognize that politics is the process by which a democracy makes decisions. We need

"... politics is the process by which a democracy makes decisions. We need to become players in the game if we are not players now."

to become players in the game if we are not players now. We don't need to worry about PACs. As in any free market, those that can gain a strong and broad following will be swept into the mainstream, and the others will become footnotes to history.

And we must act. More of us need to vote. The 38% turnout in our recent congressional elections is scandalous. After we vote we need to hold our elected representatives accountable by carefully assessing what they have done and what they have failed to do. To be fair to them, we need to communicate our views on relevant issues to them. They cannot be expected to guess what we are thinking. Surprisingly, most are influenced by the thoughtful views of an interested and knowledgeable constituent. The restoration of power to the legislature, to our elected representatives, must become one of our top priorities.

We have the best system of government ever devised. But we also have serious problems that require our attention and action. We will not solve them by ignoring them. They will require the positive action of an informed electorate. Our biggest problem is indifference. If we can solve that one, I am certain we can solve the others.

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